FEBRUARY 15, 1961
Price 50c

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

V65 #4

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"STARLITE" — STAR BRIGHT"

TE&M's proofreaders dropped an important "E" from the story describing the front cover of the February 1 issue of TE&M (see page 3, Feb. 1), and changed the name of A. E. Co's popular "Starlite" telephone to "Starlit." All hands involved in the error have been properly chastized, and the homework assignment for staff members one night last month was to write "Starlite" 100 times.

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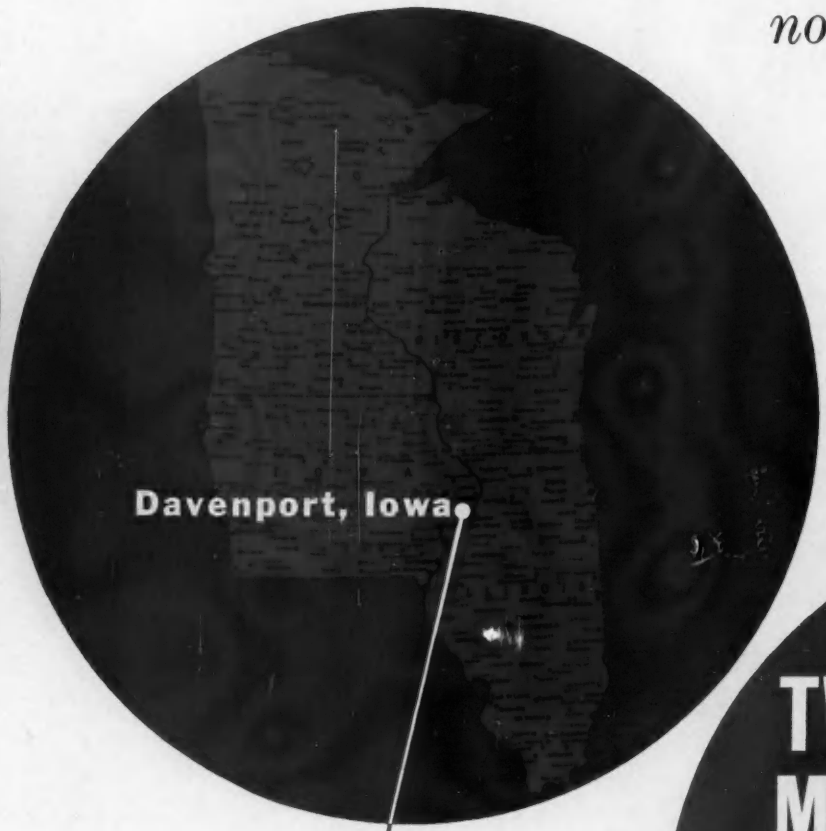

ITT KELLOG
ANNOUNCES

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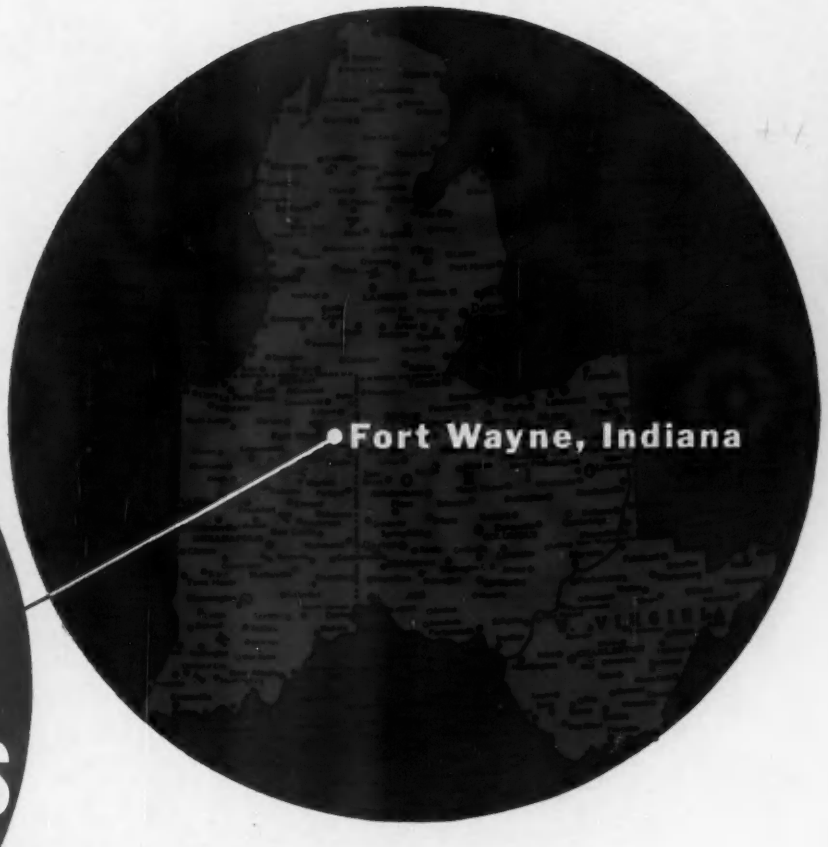
MID-
WESTER
REGIONA

George Taylor, Manager of ITT Kellogg's new supply and service facility in Davenport, serving Minnesota, Iowa, Wisconsin and Illinois.

Bob Oman, Manager of ITT Kellogg's new supply and service facility in Fort Wayne, serving Indiana, Ohio, Michigan and West Virginia.

ter deliveries, closer assistance . . .



Keeping pace with the giant steps being made by Independent Telephony throughout the country, ITT Kellogg constantly examines its own operations—searching for new ways to serve you more effectively. Our friends throughout the Midwest, for example, will now enjoy faster supply service and closer-at-hand assistance in planning and promotion—because of an expansion and re-location of Regional office/warehouse facilities in that area. *Two* offices, Davenport and Fort Wayne, will now serve the area formerly served by a single office located in Chicago.

It's all part of ITT Kellogg's determination to remain *your nearest and most dependable supplier* of telephone equipment.

ITT

KELLOGG

A Division of International Telephone & Telegraph Corporation, 6650 South Cicero Avenue, Chicago 38, Illinois

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ITT Kellogg products available in Canada through Standard Telephones & Cables Mfg. Co. Ltd. 9600 St. Lawrence Boulevard, Montreal 12, P. Q., Canada

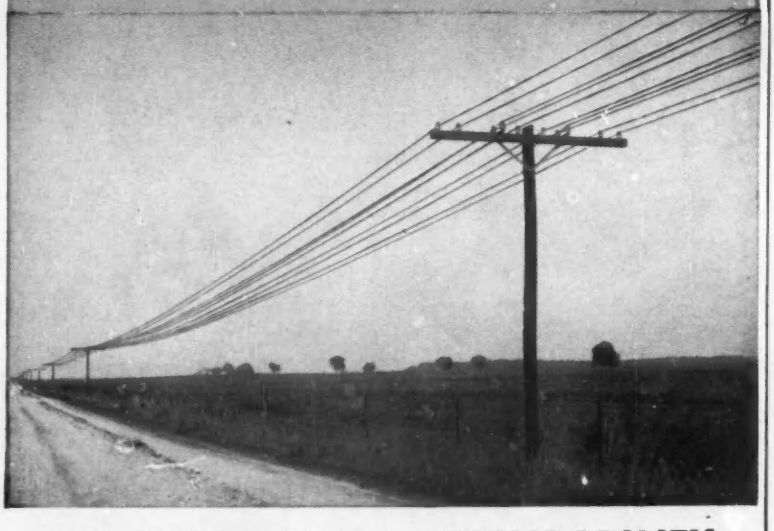
Crapo HTL-135

High Tensile Line Wire

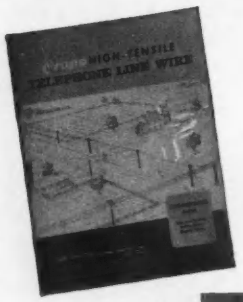
MADE TO WITHSTAND HEAVY STORM LOADS

Time and time again, *Crapo* HTL-135 has demonstrated its ability to stand up under heavy ice and wind loads when other conductors failed. This can be attributed to the fact that *Crapo* HTL-135 combines high strength with high fatigue endurance plus superior elastic qualities which enable it to spring back into place when loads are removed. The result: service interruptions are minimized, re-sagging is seldom necessary, where this rugged telephone wire is used.

The excellent telephonic transmission characteristics of *Crapo* HTL-135 make practical subscriber loops of 14 to 15 miles with normal voltages and equipment. Longer loops are possible where higher voltages and more sensitive telephone sets are employed. For dependable, long-span, low cost rural lines, specify *Crapo* HTL-135.



HERE'S PROOF OF DEPENDABILITY



The Crapo HTL-135 in this typical rural line of 300-foot spans was subjected to two heavy ice storms within 14 months. This photo shows the line, without resagging, three months after the second storm.

Write for Manual TM-59 containing complete engineering data!

Crapo HTL-135

INDIANA STEEL & WIRE CO., INC.
Muncie, Indiana

coming

CONVENTIONS

MINNESOTA Tel. Assoc., Radison Hotel, Minn., Minn., Feb. 19-22, 1961.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 7, 1961.

TEXAS Tel. Assoc., Rice Hotel, Houston, Texas, March 12-14, 1961.

IOWA Tel. Assoc., Savery Hotel, Des Moines, Iowa, March 23-24, 1961.

INTERNATIONAL POLYTECHNIC SYMPOSIA, Auditorium of the Engineering Societies, New York City, April 4-6, 1961.

NEBRASKA Tel. Assoc., Cornhusker Hotel, Lincoln, Nebraska, April 5-6, 1961.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, April 18-19, 1961.

INDIANA Tel. Assoc., Claypool Hotel, Indianapolis, Ind., May 9-11, 1961.

ILLINOIS Tel. Assoc., Pere Marquette Hotel, Peoria, Ill., May 17-19, 1961.

KANSAS-MISSOURI Tel. Association, Continental Hotel, Kansas City, Mo., May 22-23, 1961.

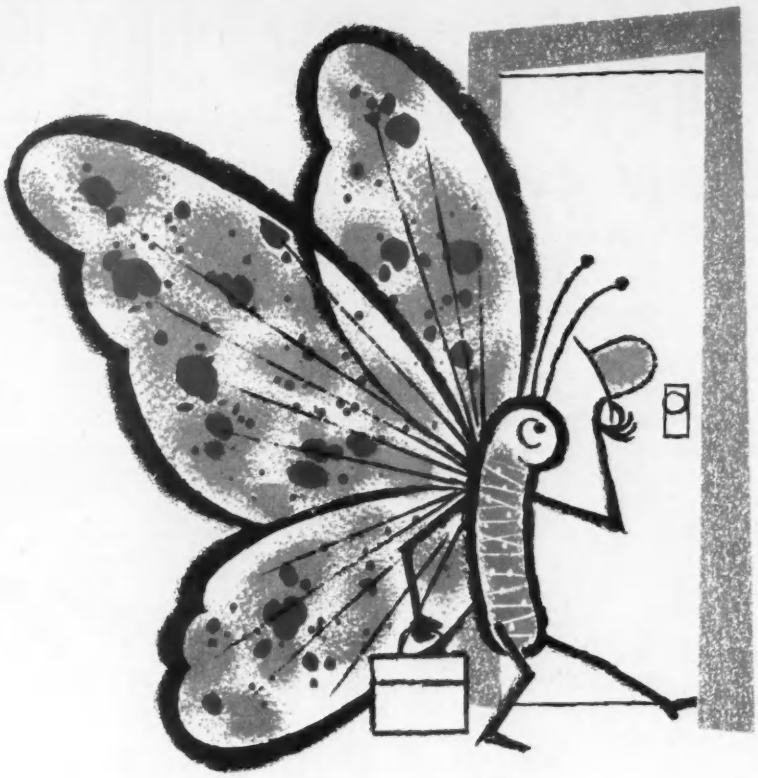
PENNSYLVANIA Tel. Assoc., Pocono Manor Inn, Pocono Manor, Pa., June 5-7, 1961.

WASHINGTON-OREGON Tel. Assoc., Empress Hotel, Victoria, B. C., June 15-16, 1961.

NEW YORK Tel. Assoc., Scaroon Manor, Schroon Lake, N. Y., June 19-21, 1961.

CALIFORNIA Tel. Assoc., Hawaiian Village, Honolulu, Hawaii, June 26-30, 1961.

ALASKA Tel. Assoc., Hotel Not Announced, Palmer, Alaska, Aug. 21-23, 1961.



Foot in the Door? Definitely

Color panel combinations to match surrounding decor.

Booths welcomed with open arms in hitherto verboten areas.

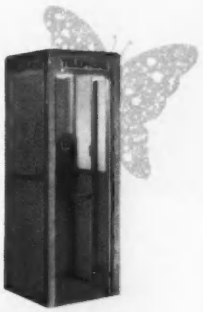
Department stores, airports, specialty shops, national chains . . . many, many others.

Booths no longer hidden in dark corners . . . are things of beauty.

Above statements not just claims – but proved.

Naturally, more revenue.

45 standard color combinations plus color service to match any decor.



the BEST BOOTH PRODUCTS

by BENNER-NAWMAN of course!

For full particulars, consult your distributor or write direct . . . Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

today's most modern common carrier

ACHIEVERFONE

AChieverfone, the new 150 Mc band mobile radiotelephone by AC, is specifically designed for all modern applications. It permits your customers to place calls whenever they wish—to any telephone in the world!

Unlike most common carrier MRS systems with only one or two frequencies, AChieverfone has a four channel capacity. This means that calls are rarely missed or delayed. Furthermore, AChieverfone's channels are selected by pushbuttons.

AChieverfone's modern design also includes a dramatic reduction in the number of components. Instead of three or more separate units, AChieverfone has only two — a unique, simplified control head and a compact R-T unit.

Consider AChieverfone for all your customers. Its styling is as attractive as the newest of today's home telephones. Feature for feature, AChieverfone is the most modern MRS system available.

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc, 4 Channel
RF output: 22.5 watts into 52 ohm load

Receiver: 144-174 Mc, 4 Channel
Wide Band (60kc) or Narrow Band (30kc) models available (Wide Band quickly converted to narrow by substituting only I.F. filter)

Frequency Stability: within 0.0005%

Selective Signaling: 51,000 five-digit (compatible, 2-tone, sequential) codes available

Size: Receiver-Transmitter, 21⅛" x 8⅞" x 6¼"

Weight: 35.5 pounds, including receiver-transmitter, control head and interconnecting cable

ACHIEVERFONE

An AChievement in Mobile Communications

AC Spark Plug — The Electronics Division of General Motors

Box 622 • Milwaukee 1, Wis. • Telephone BRoadway 3-1120

NEWSLETTER
TELEPHONE INDUSTRY

Prepared By The Editorial Staff of TELEPHONE ENGINEER and MANAGEMENT

ON THE 1st OF EACH MONTH ★ ON THE 15th OF EACH MONTH

Dear Sir: Feb. 15, 1961

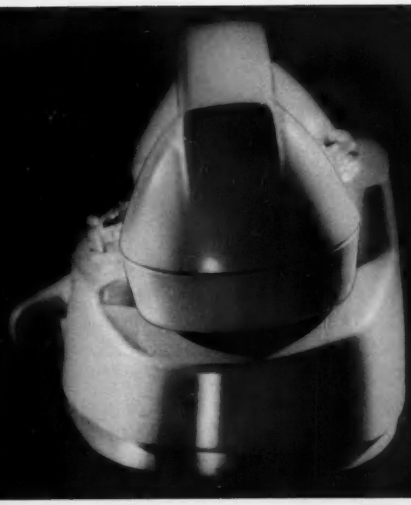
LANDIS TELLS PLANS TO SPEED UP CASES: — James M. Landis, named by President Kennedy to seek improvement in federal regulatory agencies, said last month the new administration has "no desire to increase regulation for regulation's sake." Main emphasis, he said, will be on speeding up disposal of cases involving "every phase of our economic life," & which he feels are "vital to economic growth." While it will put pressure on the regulatory bodies to make more headway, Landis said, administration will be careful not to suggest specific ways in which individual cases should be handled.

NEW YORK BILL WOULD REQUIRE METERING DEVICE ON EACH PHONE: — Bill introduced in New York State legislature last month would require telephone companies to install metering devices on each telephone to indicate number of outgoing calls & charge for use of telephone for local calls on basis of such number, except public telephones and extensions (A-1071, Corso) . . . IN ARKANSAS proposed state constitutional amendment to require that members of Arkansas Public Service Commission be elected instead of appointed by governor was introduced in state legislature by Rep. Edward L. Works of Dallas County. Measure was listed as HJR 17. . . . IN WEST VIRGINIA, a resolution to set up special committee to study current regulatory statutes, rules & regulation pertaining to West Virginia public utilities was introduced in state legislature by Senators Paul H. Moore of Jackson & William Tompos of Hancock. Measure noted "apparent need for revision of such statutes and regulations" to "protect the consumers of West Virginia . . . & to promote industrialization" of state. Committee would consist of president of State Senate & speaker of House as co-chairmen, & four members each of both branches of state legislature to be named by them.

IN NEW MEXICO a proposed state constitutional amendment introduced in state legislature would merge State Public Service Commission & State Corporation Commission into new 5-member appointive group. Proposed new agency, which would be called State Corporation Commission, would regulate & control all public utilities & all carriers of persons or property. Senate Majority Floor Leader Fabian Chavez, Sante Fe Democrat, one of sponsors of proposal, said that in effect present appointive three-member PSC would be absorbed into present elective three-member SCC. Bill presented in conjunction with joint resolution calling for constitutional change would make major change in present public utility procedures. It would prohibit utilities from putting rate increases into effect under bond, such as in current Southern Union Gas Co. case in which utility asked PSC for $3.4 million annual rate boost & then put increase into effect before commission took any action on application. Proposed constitutional amendment is similar to one submitted to voters at special statewide election in 1955. That measure failed by margin of 640 votes, 15,371 to 16,011.

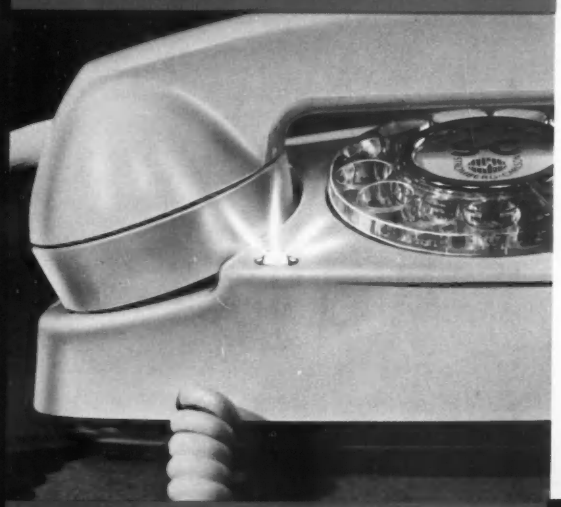
REA REPORTS NEW TELEPHONE LOANS: — Since last issue of TE&M, Rural Electrification Administration has approved 6 rural telephone loans . . . . $3,297,000 loan went to Iowa State Tel. Corp., Centerville, Ia. New borrower will acquire 10 companies serving 2,481 subscribers, add 333 miles of new line, build new dial office

Please turn to page 12



Two-party identification: this PETITE model works with any make of CDO and MDO equipment. Now you can offer PETITE phones to your subscribers no matter what make or type of switching equipment you use.

Petite



A whole series of new features and new services make the PETITE* phone not just a telephone, but a complete line of telephone instruments.

These new developments—individually and in combinations—provide you with new and additional subscriber services . . . open many new doors to greater opportunities for revenue and profit.

Your Stromberg-Carlson representative has solid proof, and he's eager to show you the eye-popping facts and figures. In Atlanta call TRINITY 5-7467; Chicago: STATE 2-4235; Kansas City: HARRISON 1-6618; Rochester: HUBBARD 2-2200; San Francisco: OXFORD 7-3630.

*A trade mark of Stromberg-Carlson—General Dynamics.

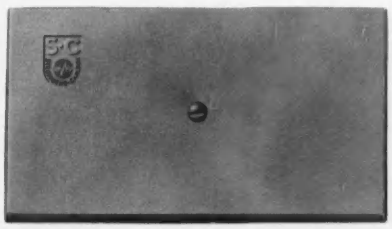
Message waiting light: This model of the PETITE phone is designed for hotels and motels . . . and for other PBX customers who have a requirement for this type of service. Many new prospects are opened up by this feature.

Better-than-ever pad: the excellent gripping qualities of the present bottom pad of the PETITE phone have been improved by the use of new materials and a new configuration. Manual PETITE phones also available with a glow-in-the-dark dial blank.

"Spotter" dial: this feature is available two ways. You can order any PETITE model with spotter dial or easily convert your present in-stock PETITE phones.

STROMBERG-CARLSON
A DIVISION OF GENERAL DYNAMICS

More revenue and PROFIT with the *Petite* phone line



If your requirement is for frequency ringing, here is your best possible buy. The ringer for the PETITE phone is up to 50% smaller than other comparable ringers in the industry. Costs a lot less, too! The PETITE phone plus the compact ringer is your best buy.

(Continued from page 9)

at Centerville, and install 10 new dial offices . . . . $3,152,000 loan to Colorado River Tel. Co., Blythe, Calif. Company will use money to furnish initial service to 2,661 subscribers & improve service for 2,756 others . . . . Piedmont Tel. Co. Manassas, Va., received $1,874,000 loan to finance construction of communications system to provide telephone service to approximately 165 subscribers through 2,160 stations at Dulles International Airport, Chantilly, Va.

Fillmore (N. Y.) Tel. Co. will use $1,607,000 loan to improve service for 2,471 subscribers and furnish initial service to 827 others. Borrower proposes to acquire Cato & Meridian Tel. Co. . . . . $222,000 loan to Chateau Tel. Co., Tulsa, Okla., will be used to construct 107 miles of new line to bring service to 412 new subscribers . . . . $222,0000 loan to Inland Tel. Co., Champaign, Ill., will be used to improve service for 359 subscribers and provide initial service for 52 others.

FCC APPROVES AT&T PLANS FOR RESEARCH IN SPACE COMMUNICATIONS: — Plans of American Tel. & Tel. Co. to conduct extensive research into earth-satellite communications were approved by FCC last month, but Commission dismissed companion part of AT&T request for changes in FCC rules which would have permitted company to go ahead with initial stages of commercial service, following satisfactory tests.

Holmdel, N. J., fixed earth station, which will transmit to and receive from radio installations on as many as six satellites yet to be launched, will operate on 6325-6425 megacycles, while satellite stations will use 4100-4200 mc. Frequencies are in bands set aside for common carrier use. In initial request, AT&T proposed operation on 6775-6875 mc to satellites & 6425-6525 mc from satellites. Number of organizations interested in private microwave field filed requests for oral argument, & opposed applications as submitted, declaring tests should take place in frequencies set aside for common carrier use. Regarding proposal to change rules to permit start toward commercial service, opponents took position that this would be means of obtaining "automatic frequency reallocation."

AT&T expressed pleasure at decision in statement declaring "we can now firm up our plans for the next step toward a space communications system. We are most anxious to have an active satellite in orbit within a year, and will push vigorously toward this. To do so, we have asked the government to supply launching facilities and we have offered to pay the costs. "Through satellites we will be able to supply the fast-growing need for international communications. Our cable & radio network carried nearly 4,000,000 telephone calls last year, & calling is increasing by nearly 20% every year. By 1980, we expect there will be 100,000,000 calls a year, 25 times what we have today. In addition, satellites will make possible the international transmission of television and other forms of communication not feasible with today's cable and radio circuits."

MERGERS & ACQUISITIONS. — Tri-County Tel. Co., Inc., Everton, Ark., will purchase Jasper (Ark.) Tel. Co. & convert Jasper exchange to dial . . . . Colver (Pa.) Tel. Co. will purchase New Alexandria (Pa.) Tel. Co. & replace magneto facilities with dial . . . . Totah Tel. Co., Ochelata, Okla., has acquired following companies: Wann (Okla.) Tel. Co.; Montgomery County Farmers Mutual Tel. Co., Tyro, Kans.; Hewins (Kans.) Tel. Co.; Elgin (Kans.) Tel. Co.; Liberty (Kans.) Tel. Exchange. Totah Tel. Co. will convert the five acquired magneto exchanges to dial . . . . Indian Creek Valley Tel. Co. purchased Laurel Hill (Pa.) Tel. Co.

NEW YORK STATE TELEPHONE ASSOCIATION FURTHERS PROGRESS OF INDEPENDENTS IN EMPIRE STATE

The Independents who make up the New York State Association are among the nation's progressive telephone companies. In executive secretary Hamilton A. Cunningham, this group has a man of outstanding competence and dedication in its program of coordinating the state's communications facilities; one who has repeatedly extolled the virtues of vigorous marketing and sales campaigns to make telephone service more readily available. Of course, adequate coin box installations are a part of such programs.

One of America's fastest growing Independents, the Rochester Telephone Corporation now serves some 300,000 stations. Back of this New York state company's impressive progress is a sustained program of service to subscribers. Under the direction of Joe W. Phillips, coin box manager, this firm's subscribers enjoy the most modern communications facilities. For example . . . this Sherron stainless steel multiple booth installation, located in the telephone area of the Rochester Airport.

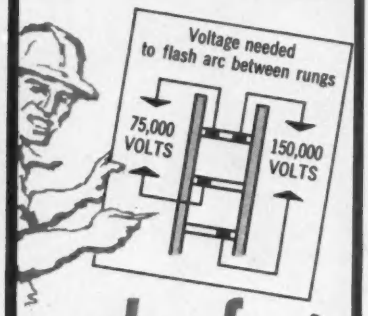
as exemplified by ROCHESTER TELEPHONE CORPORATION

SEE OUR CATALOG IN SWEET'S
INDEPENDENT
Sherron ACOUSTIC V SEE-THRU STEEL-STAINLESS STEEL OUTDOOR AND INDOOR TELEPHONE BOOTHS

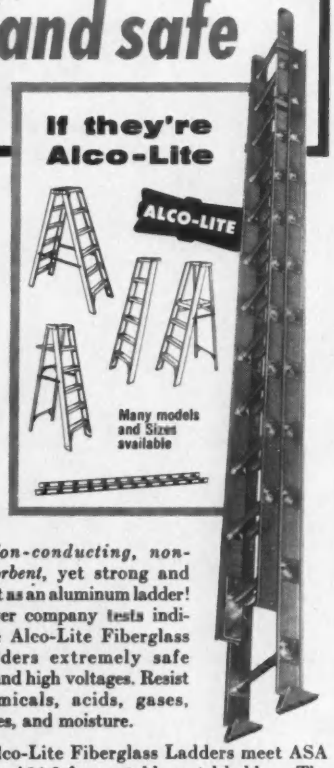
There's a Sherron booth for every location and budget in either zinc coated or stainless steel

SHERRON METALLIC CORP., 1201 FLUSHING AVE., BROOKLYN 37, N.Y.

fiberglass ladders are strong



and safe



Non-conducting, non-absorbent, yet strong and light as an aluminum ladder! Power company tests indicate Alco-Lite Fiberglass Ladders extremely safe around high voltages. Resist chemicals, acids, gases, fumes, and moisture.

Alco-Lite Fiberglass Ladders meet ASA Code A14.2 for portable *metal* ladders. The wider side rails are SOLID fiberglass—not plastic covered soft wood. The wide steps and rungs are high tensile strength aluminum. More riveting and bracing throughout!

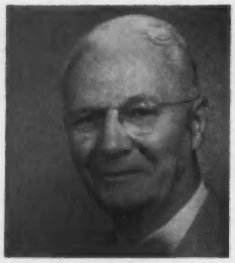
Ladders safe, strong, more rigid, have longer life, because of exclusive design and construction. Maintenance negligible. *SEND FOR CATALOG!*

Original Manufacturer of ALUMINUM Ladders

Aluminum Ladder Co.

West Darlington Street Ext,

FLORENCE 1 S. CAROLINA



INDUSTRY OBSERVATIONS

By L. A. GRITTEN

Plea For Unity

THE Wide Area Telephone Service development is one more step toward an amazing future in communications, another milestone in the journey that may lead ultimately to fulfillment of a Bell System official's prophesy, that some day every man and woman on earth may carry his own portable videophone, whereby he will be able to converse face to face with anyone else in the world.

The splendid work of the Bell System in this spectacular advance is a source of pride to every right-thinking American. We Independents are as proud of the progress proclaimed from time to time by Mr. Kappel as we are of the triumphs of our own great operating companies and manufacturers. Our entire industry is working hand in hand to hitch its wagons to the stars. But —

We respectfully suggest to Mr. Kappel that there is a rift within the lute that mars the entire effort. Twenty-first century concepts are tied to some nineteenth century thinking in commercial matters.

It is not good that the U.S.I.T.A. and the large Independent operating companies find themselves compelled to request the F.C.C. to delay action on a Bell System filing. It is not good that Independent companies must, in self-defense, request the help of State regulatory commissions to obtain a fair consideration of toll settlements formulae that have the approval of the N.A.R.U.C. And it is not good that, time after time, changes in Bell services have been put into effect without pre-discussion with, or adequate consideration of, the Independent operators who are sharply affected and whose cooperation is essential.

In other regards, our differences generally are ironed out in a spirit of enlightened cooperation; but that spirit is lacking in this matter of settlements and advance discussion of changes to come.

It is an unhealthy lack. It invites a regulatory "plague on both their houses" attitude that could easily lead to all-embracing governmental control of affairs that should remain strictly our own business. We cannot afford to wrangle in public.

There must be a better way. Our commercial arrangements should be attuned to the spirit that animates other phases of our mutual development.

Penance Wanted

IN BALTIMORE a cable splicer transposed two pairs. So when a radio announcer said he was calling Mrs. Mary Cohen's number on a $500 "give away" program, the wrong telephone rang. The gallant officers of the Chesapeake & Potomac Telephone Company made good. They sent Mrs. Cohen her $500.

This sort of penance should work both ways. If Mrs. Cohen gets $500 because her 'phone didn't ring when she wanted it to, we should be compensated for the dozens of infuriating calls we don't want.

For example there is the fiend in human form whose call drags us from our dinner table to hear: "What program are you listening to now?"; the giggling high school gal who sells magazines in her spare time; and the booze-laden celebrator who burps: "I want the Red Crow Tavern. Wotinell you wanta answer for?"

Even at so low a rate as $5 apiece,

Please turn to page 22

ANNOUNCEMENT

Some of our customers and distributors have expressed concern that, with the introduction of our new line of FLOTROL rectifiers and other devices using solid-state components, we are discontinuing the manufacture of LORAIN equipment using selenium rectifier and magnetic components. This is not the case.

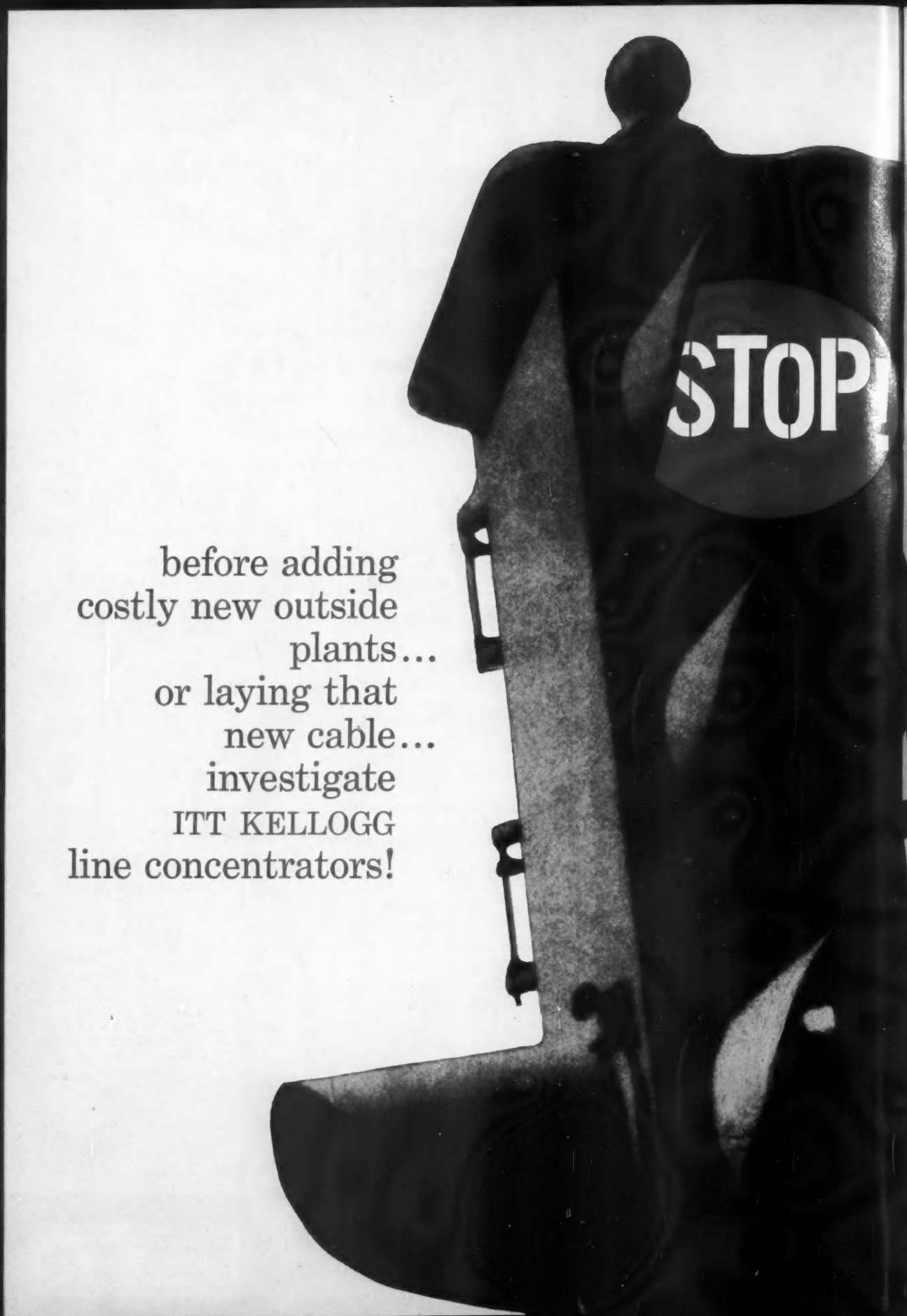
Lorain *is not* discontinuing the production of FLOTROL charger-rectifiers, SUB-CYCLE ringing converters and LORAIN power supply units of the type which have served the communications industry so reliably in the past. LORAIN is still supplying the continuing demand of the communications industry for these dependable units.

LORAIN has also designed and is producing for the communications industry, the most advanced charger-rectifier equipment, frequency converters, tone generators and power supply units which utilize silicon rectifiers, transistors and other solid-state devices.

LORAIN *Products Corporation* LORAIN, OHIO

LORAIN PRODUCTS (CANADA) LTD.—ST. THOMAS, ONTARIO

DESIGNERS AND MANUFACTURERS
SUB-CYCLE® CONVERTERS FLOTROL® RECTIFIERS
PARTNERS IN DEPENDABILITY



before adding
costly new outside
plants...
or laying that
new cable...
investigate
ITT KELLOGG
line concentrators!

meet new service demands quickly, economically, with cost-cutting ITT Kellogg line concentrators!

An ITT Kellogg Line Concentrator can be an easier, more economical, *better* way of supplying high grade service to that growing surburban community • new housing development • resort area military installation • outlying factory • hotel • motel • trailer park • fair ground, etc.

Meet new service demands fast—because an ITT Kellogg Line Concentrator—one compact unit at subscriber area, one in central office—requires little more than jumpering and can be put into full operation in days—by your own crew! You meet new service demands economically—because the entire cost of a Line Concentrator is *less* than the cost of 1 mile of 19 ga. 26 pair cable!

Here's what it does: Invariably, present cable pairs nearest your new service area) are probably in full use *less* than 10% of the time. The L-52 works on a line sharing principle . . . allows you to utilize assigned (though idle) lines.

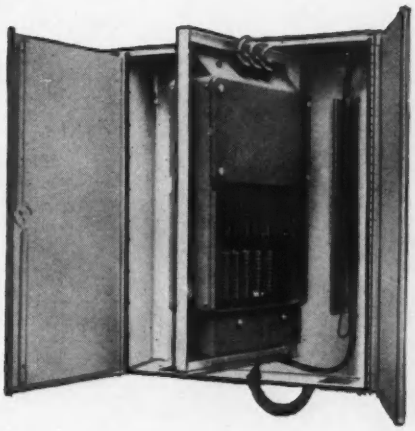
These two popular models fill most needs . . .

Model L-52B 52 lines derived from 12 trunks and 2 control pairs.

Model L-52D 104 lines derived from 20 trunks and 2 control pairs.

Both models operate on loop resistances up to 1700 ohms with 48 VDC, or up to 2400 ohms with 60 VDC.

For complete details and technical information, or an appraisal of your Line Concentrator requirements, see your local ITT Kellogg Representative or call or write the ITT Kellogg Regional Office nearest you.



ITT **KELLOGG**

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6650 South Cicero Avenue, Chicago 38, Illinois

Telephone and Transmission Dept.
2912 Wake Forest Road, Raleigh, N. C.

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IOWA: 1111 East River Drive, Davenport, Iowa, 324-0441.
KANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418.
NEW YORK: 327 North West Street, Syracuse, N. Y., HArrison 2-9251.
TEXAS: 1359 Motor St., Dallas 7, Texas, Riverside 7-5191.

ITT Kellogg products available in Canada
through Standard Telephones & Cables Mfg. Co. Ltd.
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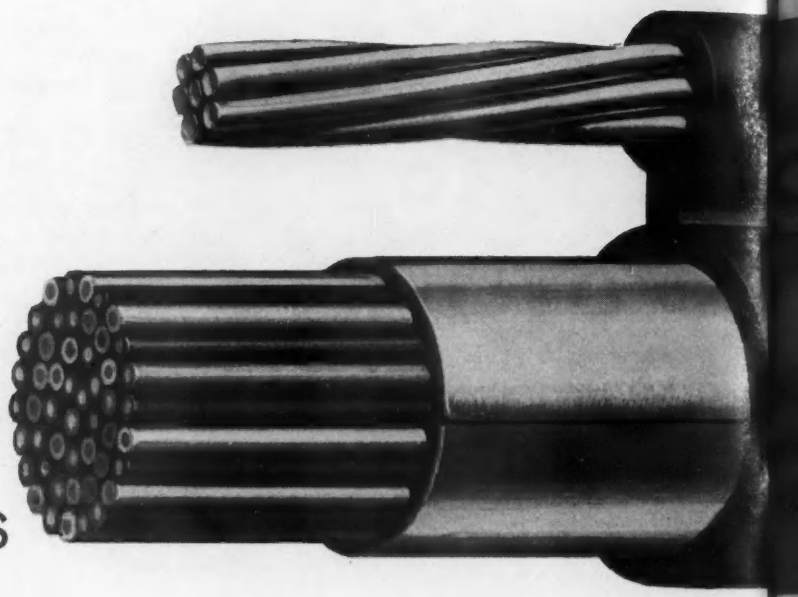


GENERAL CABLE'S

FIGURE 8 QUALPETH*

ends cable spinning... saves you time and money

Here's a great new cable that saves you time and money on outside plant construction. Figure 8 Qualpeth combines the cable and messenger in a single jacket of tough polyethylene. This revolutionary cable makes installation a one-step process. The entire cable-spinning operation is eliminated. Your lineman merely clamps Figure 8 to the pole.

Figure 8 is equipped with your choice of aluminum or copper shield. Normal splicing methods and closures are used. And, best of all, Figure 8 costs less installed than cable and messenger installed separately!

We're saving a copy of the Figure 8 Qualpeth catalog for you. To get your free copy, write: Automatic Electric Sales Corporation, Northlake, Illinois. And the next time you want to extend your outside plant, contact your AE representative. He'll give you all the money-saving details on Figure 8 Qualpeth.

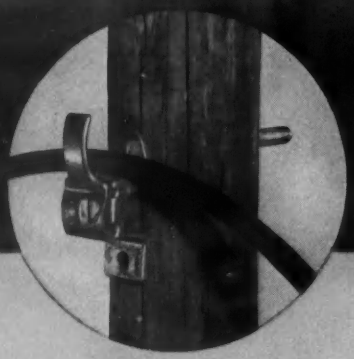
**Trademark of General Cable Corporation*

AUTOMATIC ELECTRIC

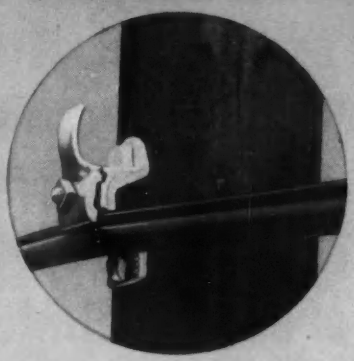
Subsidiary of

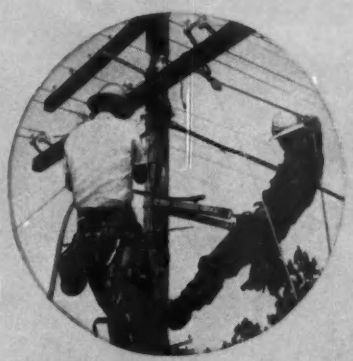
GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM



SPECIAL SUPPORT MAKES INSTALLATION EASY
This specially designed clamp is bolted to the pole to serve you two ways. First, the cable is strung over the top of the clamp for easy handling. After tensioning, the lineman just clamps Figure 8 to the pole, and the job's done.





CREW INSTALLS FIGURE 8 FASTER
At a recent installation of Figure 8, the crew saved so much time that the in-place cost was reduced by 10% over the cost of the present cable-spinning methods.

warehouses:

Northlake Illinois Fillmore 5-7111	2915 Moore St. Richmond 21, Va. ELgin 8-9280	2360 N. W. Quimby St. Portland 10, Ore. CApital 3-7244	158 Corliss Avenue Johnson City, N. Y. RA 9-4996	2021 Main St. Kansas City 8, Mo. HArrison 1-7575

THE BIG DIFFERENCE IS HERE

Sealed messenger strand: a seven strand galvanized steel support in which all interstices are filled with a water-proofing compound. This prevents water from entering between the support strand and overlying jacket, thereby minimizing strand corrosion. **Seven wire support strand:** linemen are accustomed to handling a seven wire steel strand...no special techniques or hardware required. **Economical:** Figure 8 Qualpeth Exchange Cable saves on installation costs...it goes up in one operation instead of three with specially

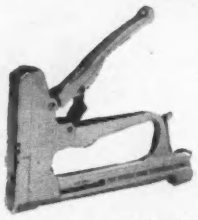
GENERAL CABLE FIGURE 8 MESSENGER SUPPORTED QUALPETH EXCHANGE CABLE

designed tangent supports for faster, easier stringing. Buy and install General Cable Figure 8 Qualpeth Exchange Cable, designed and manufactured for the Independent Telephone Systems of America. General Cable Corporation, 730 Third Avenue, New York 17, New York. Distributed by: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 W. Randolph St., Chicago 6, Illinois.

GCC

GENERAL CABLE CORPORATION

WORLD'S FINEST STAPLING GUN
for wire or tubing

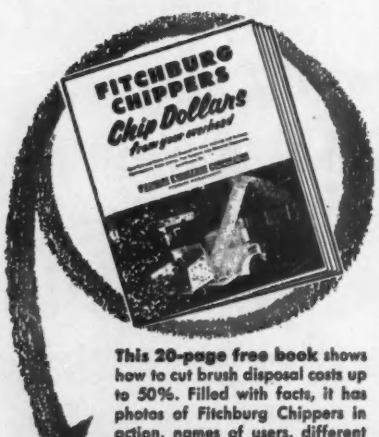


HELLER-TM-1

The Heller TM-1 one-hand automatic stapling gun is specially designed for quick professional fastening of wire or small tubing. With controlled power chamber, staples can't pinch wire yet lock securely in hard or soft wood and plaster. One of a complete line of over 300 hand and power fastening devices made by Heller, a leader in the field for more than 35 years. Write Heller Industrial Fastener Division, Heller Roberts Mfg. Corp., 6115 Carnegie Ave., Cleveland 1, Ohio.

HELLER ROBERTS
Manufacturing Corporation

HOW TO SAVE MAN HOURS IN BRUSH DISPOSAL



This 20-page free book shows how to cut brush disposal costs up to 50%. Filled with facts, it has photos of Fitchburg Chippers in action, names of users, different models to solve specific problems.

Mail coupon for your copy today!

FITCHBURG ENGINEERING CORPORATION
Fitchburg, Mass., Dept. TEM-12
Please send free booklet "Chip Dollars From Your Overhead."

*Name*_____
*Company*_____
*Address*_____
*City*_____ *State*_____

"Industry Observations"

(Concluded from page 14)

these infernal annoyances should net us far more than Mrs. Cohen's half a grand. The telephone company shall hear from our attorney.

Commonsense vs. Paper

THE experience of a major British chain store should be required reading in every business administration course. Marks and Spencer is a 237-store chain in Britain. Annually they sell about half a billion dollars worth of fruit, baked goods and clothing. They handle some 7,000,000 customers every week. About three years ago, Sir Simon Marks, head of the firm, waged war on paper.

Every form, every inventory card, every paper record of any sort, was subjected to the question: "What happens if we don't do this?" Within a few months 26,000,000 forms weighing 120 tons, were scrapped. In consequence, out of 28,000 jobs, 8,000 were eliminated. (But nobody was fired; they merely stopped replacements for a few months.)

Also tossed into the discard were time clocks. This actually improved punctuality — and scrapped a million time cards. Bulk purchases of such things as toilet paper and floor cleaner were stopped; the cost of storing them outweighed the saving in first cost.

Some noteworthy American firms have been watching Marks & Spencer's war on paper and are in course of doing likewise. Could it be possible that your company . . . . No! Perish the thought. Forgive us for even suggesting it.

Science Begins At Home?

WHEN every newspaper and magazine drips with headlines about spatial exploration for political, military and business objectives, it is hard to keep one's mind below the ionosphere. It comes then as a shock to read an emphatic protest from Fred Hoyle of Cambridge University, one of the world's greatest astronomers.

Professor Hoyle strongly opposes (in *New Scientist*) a proposed multi-million dollar British space program. He points out that in scientific research journals, the space subjects amount to no more than one per cent of the total volume of papers. "Scientific standards," he says, "must decline if too much money chases too few ideas." He feels that "just as it is in America and Russia," the British plan is emotional and not scientifically based. In America, he states, the disintegration threatened by the space program seriously threatens the whole scientific fabric of the nation.

Hoyle objects to a program that "would grossly overmagnify one particular facet of science." Somehow it recalls the question posed by the Grand Lumar, the imaginary ruler of the moon, in H. G. Wells' "First Men in the Moon." He asked the earthly explorer why earthlings were so interested in the moon when apparently they knew so little about their own planet.

Misrule By Directives

A DENVER Chamber of Commerce explains the various forms of government. It defines both Syndicalism and Communism as systems in which the theory of law is that "Directives and Regulations assume an equal position with laws."

That is probably a correct interpretation. It is frightening if you apply it to this country. Certainly we are well along the road to rule by departmental directives and regulations. A horrible example is the recent ruling of Internal Revenue officials, penalizing utilities for advertisements that are objectively critical of government ownership. Rule by governmental department heads can be — and usually is — misgovernment at its worst. The Boggs Bill (H. R. 640), now before the 87th Congress, seeks to correct the Internal Revenue autocracy. Tell your Representative what you think about it! — *Leslie A. Gritten.*

Rex

DIRECT BURIAL CABLE

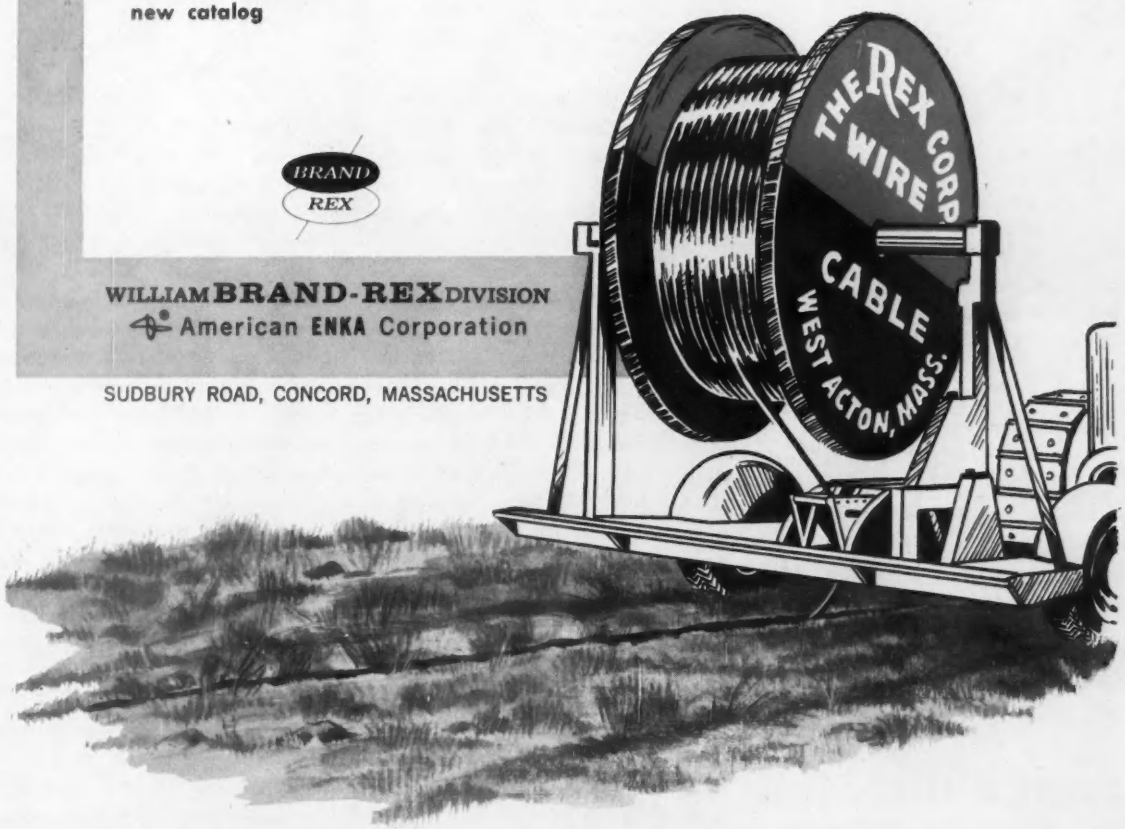
TO R.E.A. PE-23 SPECIFICATIONS

For information on our complete line of plastic insulated telephone wire and cable — write for new catalog

BRAND REX

WILLIAM **BRAND-REX** DIVISION
American **ENKA** Corporation

SUDBURY ROAD, CONCORD, MASSACHUSETTS



When YOU Buy More . . .
THIS IS THE BRAND
P&H
PENTA
TO LOOK FOR
P&H
NORTHERN WHITE CEDAR
PENTA POLES
PENTA treated top-to-butt for years of added pole-line service resulting in far less per annum costs. Dependable service by a company who has been serving telephone companies for more than 50 years.
PAGE & HILL, inc.
MINNEAPOLIS 3, MINNESOTA

keeping up with COMMUNICATIONS

"Optical Maser" produces a spot of red light that may have signaled a new communications era . . . Adaptation of the party line principle aids pilots . . . Bigger "star in the sky" coming up.

Optical Maser May Signal In New Era

A SPOT of red light flashed recently on a Bell Labs screen at Murray Hill, New Jersey, may well have signaled a new communications era.

For the first time in the history of mankind, *coherent light* was projected. This is a beam of light which has a definite phase relationship from point to point. In other words, it doesn't radiate or scatter. It is not, like ordinary light, a mixture of frequencies.

Since it is the property of *coherence* that makes it possible for us to send messages and pictures over radio waves, the transmission implications of a beam of coherent light are highly important.

The device which produces coherent light — the spot of red — is called an "optical maser." The maser principle has had other applications, but this is the first time it has been successfully applied this way to light. Formal name of the maser (pronounced like "may, sir") is Microwave Amplification of Stimulated Emission of Radiation. In initial tests, an optical maser light beam was sent over 25 miles between Holmdel and Murray Hill, New Jersey.

What does the optical maser promise for the future? Scientists around the world are speculating. On one thing they're all agreed — visible light can carry far greater amounts of information than can radio waves. And if optical maser beams can be used in a wave-guide system (a kind of hollow pipe now used for microwaves) the possibilities are fantastic. Protected from atmospheric dust and fog, a single beam of light could conceivably transmit 10 *million* TV programs or a *billion* telephone conversations.

The maser also may make it possible to measure great distances with millionth-of-an-inch accuracy. Highly concentrated maser light may be used to push a satellite into a more perfect orbit.

Jet-Age Party Line

AN ADAPTATION of the old telephone "party line" principle is expected to bring up-to-the-minute weather information to pilots who must move with the speed of a jet.

At government request, Bell Telephone Laboratories proposed a new system which can relay weather information to airport weather stations faster than ever before. It would make possible a more accurate nationwide weather analysis featuring a constant flow of fresh data for pilots planning flight routes.

The "party line" is a backbone data transmission network across the country. Any of thousands of receiving stations may "listen in" on weather information being transmitted along the line to or from a central computer station.

Today, with other systems now in operation, a pilot checks in at the airport weather station before filing his flight plan. On the basis of available information — some of it as much as a day old — he plots his course to a

MORE FOR YOUR DOLLAR...

AN EXIDE POWER PACKAGE

The battery you need

The charger you need

The service you need

Ask your Exide man which battery type will give you the greatest economy and you can expect an answer based on engineering fact. Because only Exide offers you so broad a range of battery types—broadest in the field. It includes pasted plate Tytex with Silvium* or calcium, long-life Exide-Manchex Planté with Silvium, low-maintenance pocket positive nickel-cadmium, and the new 20-year Exide-Ironclad tubular with Silvium.

But total power economy also depends on the charger and service. Which charger? New Exide silicon rectifier types are available in a range of sizes to meet any application needs. High efficiency means you get the maximum charging power per dollar of cost.

Wherever you are, Exide service is nearby—with over 200 factory-trained battery specialists coast to coast. It's all part of the Exide power package. Find out how it can benefit you. Write Exide Industrial Marketing Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

**Silvium is Exide's patented corrosion-resistant grid alloy*

Exide®

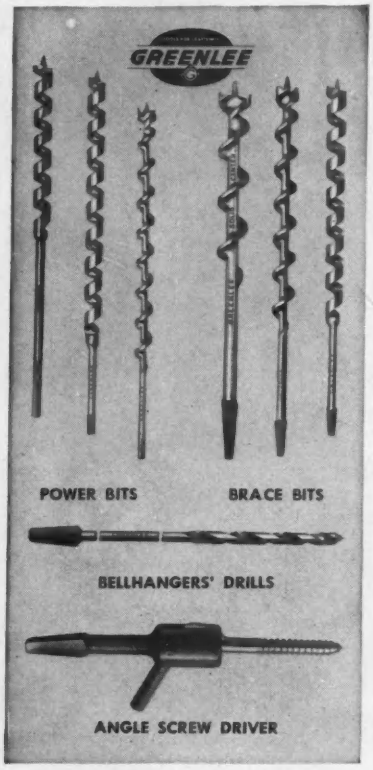
INDUSTRIAL MARKETING DIVISION

The Electric Storage Battery Co.

ESB

FAST CUTTING

high-quality tools for pole, crossarm, and wiring jobs...



Installations go smoother, faster when you standardize on precision-made GREENLEE tools. Wide choice of bits, drills, and ship augers for power drill or brace use. See your distributor or write for literature.

NEW GREENLEE NO. 437 UTILITY CHISEL

An all-new GREENLEE chisel for cutting daps in line poles. Blade is 2" wide, and heat-treated the full length for maximum service. Handle can't loosen or come off. Tough plastic handle . . . steel capped . . . extra long for firm, comfortable grip.

GREENLEE TOOL CO.
1778 Columbia Ave.
Rockford, Illinois
GREENLEE

"Keeping Up With Communications"

(Concluded from page 24)

distant point. Since the weather can change quickly, he may hit unexpected turbulence or arrive at his destination to find the field closed in by bad weather. To be sure of making a safe landing, today's aircraft— particularly the swift transcontinental jets — must carry great quantities of extra fuel to permit them to find another landing spot or by-pass storm areas. This is expensive in terms of fuel cost and wasted payload space.

The Bell Laboratories'-proposed weather party line — studied at government request — would feed much more current information rapidly from local weather forecast units to a computer center and thence to local weather stations anywhere at a rate of more than 1,000 words a minute. Only the data needed by the individual receiving station would be received from the new system's transmitters. (Currently, an individual station is likely to need only 25 per cent of the information it receives, and it arrives slowly at about 75 words per minute.) The weather information each station would accept is the latest — with weather reports often less than 10 minutes old.

The system was proposed by the Laboratories after a study of data transmission requirements. It is now being set up by government contractors.

A Bigger Star Planned By Schjedahl Co.

THE manufacturing company that made Echo I, the balloon satellite, has announced it is now equipped to make similar devices up to 10 times as large as the original.

Richard Slater, project manager for the G. T. Schjedahl Company, Northfield, Minn., said his company could produce the thin balloon skins up to 1,000 feet in diameter and of any shape. Echo I was 100 feet in diameter.

The company is also exploring techniques for making the inflatable space structures more rigid once they are in orbit. Echo I developed wrinkles in its skin because of differences in temperatures as it passed in and out of the earth's shadow.

Transatlantic Cable Capacity Doubled

THE conversation capacity of the second transatlantic telephone cable has been doubled by TASI equipment made at W.E.'s Merrimack Valley Works and installed on this side of the ocean by W. E. installers.

The Long Lines Department of AT&T has announced that the oceanic system, between Newfoundland and France, can handle up to 84 conversations at the same time. The call-carrying capacity of the deep-sea circuits was boosted by terminal equipment of new design and by the complex transmission system, TASI (Time Assignment Speech Interpolation), which takes advantage of periods of silence in a conversation to use the same circuit for another conversation. The TASI equipment just installed in New York and Paris contains some 35,000 transistors and diodes at each end. W. E. supervised installation of the equipment in France.

Telephone Service In The Skies

PUBLIC telephone service in the skies between the Chicago-Detroit area has been expanded to create an aerial communications corridor stretching to the Atlantic.

In establishing the two-way air-ground telephone facilities in three more cities, New York, Pittsburgh and Washington, D. C., service has been extended throughout aviation's "Golden Triangle" — the area which originates about a third of the nation's air passenger travel and a fourth of all private flights.

When commercial airliners are equipped for the service, passengers will be able to call anywhere in the world-wide telephone network while flying within the coverage radius (calling range) of the cities.

PRODUCT DEPENDABILITY *is built into* Phelps Dodge Direct Burial Telephone Wire & Cable!

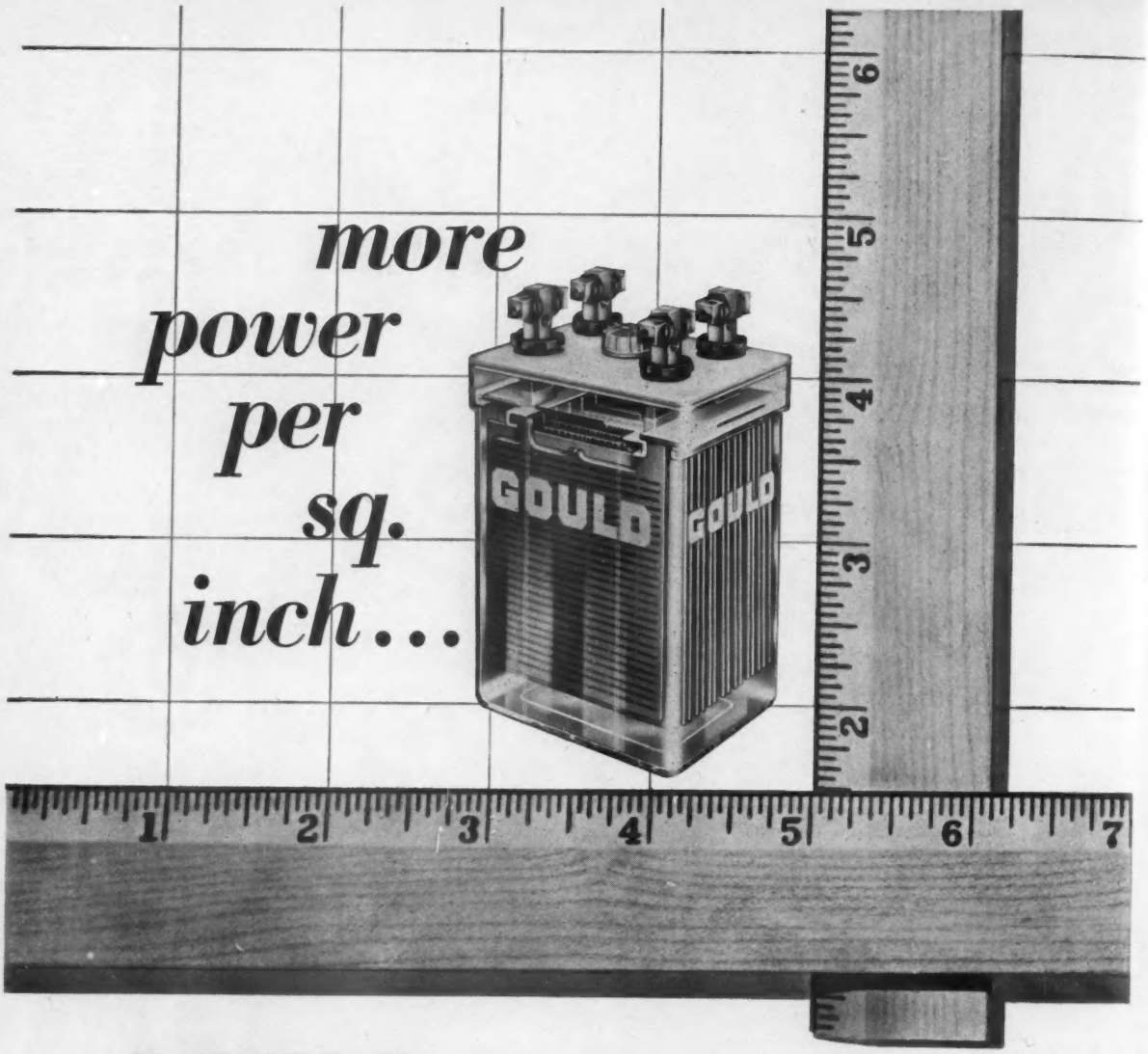
In every Phelps Dodge direct burial telephone wire and cable, dependability of product is recognized as the first requirement for satisfactory service.

Phelps Dodge achieves product dependability by combining years of manufacturing experience with the most modern research and development facilities throughout its fabricating process. This controlled method of building in quality *during* manufacture assures customers reduced maintenance costs and trouble-free service—important advantages that only true product dependability makes possible.

Phelps Dodge will gladly help you fill your direct burial wire and cable requirements and recommend the correct constructions to fit your needs. Just call your nearest Phelps Dodge sales office.

PHELPS DODGE COPPER PRODUCTS
CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Wayne, Greensboro, N. C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Tampa, Washington, D. C.



GOULD *stationary batteries*

In the new, compact Plastrite Jar, Gould Stationary Batteries save 30 to 40% floor space. This means much greater power in a lot less space—you can actually increase your battery room capacity without increasing the room size!

All new design assures top performance. New Silicone O-Ring post seal expands under compression, prevents escape of electrolyte. New stronger posts assure full current-carrying capacity with maximum voltage at all times. Improved element suspension eliminates possible cover breakage due to weight of battery element.

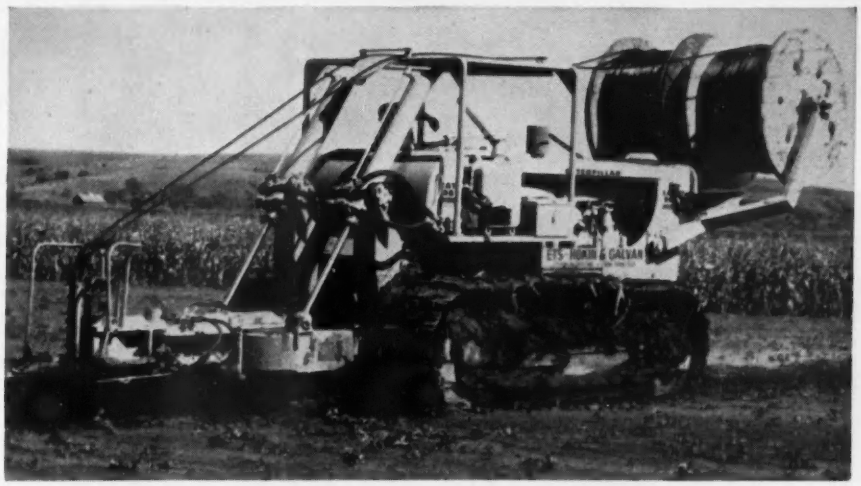
For big power when you need it—quick, reliable current for longer than a moment—new Gould Stationary Batteries in Plastrite Jars offer long, trouble-free service either full float or cycle operation.

Gould Stationary Batteries in Plastrite Jars are available in Planté, Calcium, or Kathanode. Write for details today, or call your local Gould office listed under "Batteries—Industrial" in the Yellow Pages. Gould-National Batteries, Inc., First National Bank Building, St. Paul 1, Minnesota. In Canada, write to Gould-National Batteries of Canada, Ltd., 1819 Yonge Street, Toronto, Ont.

More Power to You from **GOULD**

IMPORTANT NEW PRODUCTS

IF YOU HAVE CABLE TO LAY...



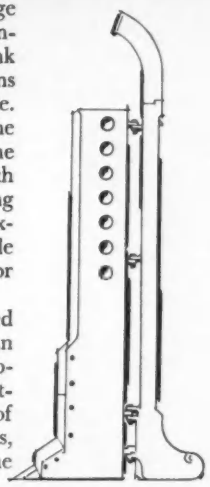
here's the newest, fastest, most profitable method!

In our vast missile base construction program alone, there will be an estimated 100,000 miles of underground cable to be laid. Heretofore this work has been both time-consuming and costly with trenching providing the most accurate method of placing cable in the ground.

Now, the Kelley Products Division of Crutcher, Rolfs, Cummings, Inc., Houston, Texas, introduces a cable laying attachment for all models of Caterpillar track-type Tractors equipped with a Cat hydraulic control unit. Cable is precisely laid at specific depths in a fraction of the time formerly required *and* with 60 to 90 per cent less cost.

The new Kelley Cable Layer puts down any cable up to 3½″ O.D. at depths ranging from a 12″ minimum with the D4 to a 72″ maximum with the D9. The laying shank is far enough behind the tractor to permit unrestricted maneuvering without deviating from the cable line yet close-coupled enough to provide accurate control of depth and position. Vertical movement of the tool bar is attained by two 7″ hydraulic cylinders with 48″ stroke. Lateral movement, also hydraulically controlled, permits offset laying within 24″ of paving or buildings, abutments, shoulders, culverts, bridges, etc. Exacting placement of the shank is attained. This feature also permits steering of the cable-laying shank when turns are made.

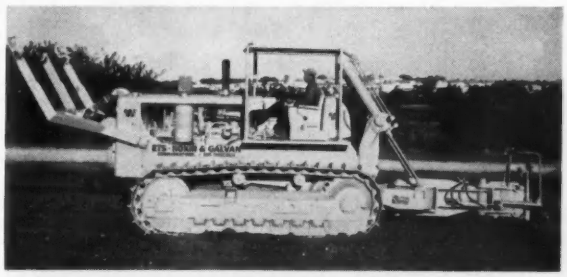
Shanks are available in a variety of cable-matching sizes and widths to reduce drag and possible damage. Shanks are of high-alloy, wear-resistant steel with replaceable leading edge and point. The cable guide or conduit, attached to the ripping shank with hardened pins, swivels and opens for easy removal or insertion of cable. A roller section, at the bottom of the conduit, guides the cable into the channel created by the ripper with the very minimum of drag, bending and friction. Cable pull rarely exceeds 100 lbs. with the Kelley Cable Layer though cable is designed for much higher load.



Cable reel carriers, front-mounted for better balance and visibility, can be custom-engineered for specific applications. Control is by a Cat front-mounted Cable Unit. Full reels of cable, weighing up to 7000 pounds, are automatically unreeled by the drag or pull on the line.

On actual cable-laying contracts, the Kelley Layer averages about a mile of cable each hour. When a Kelley extra-heavy duty Ripper is used in conjunction to open a path for the Cable Layer, production is profitably boosted. The speed and accuracy of the Kelley Cable Layer reduces costs over previously-used methods by 50 to 60%!

Kelley Cable Layers have already proven their ability on several major construction projects. If there is cable to lay on a contract, present or future, contact your Caterpillar Kelley Dealer for more information on the new money-making Kelley Cable Layer.



KELLEY PRODUCTS DIVISION
Crutcher-Rolfs-Cummings, Inc.
P.O. BOX 2073
HOUSTON 1, TEXAS

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NEW One-Piece Crossarm
Tangent Support...
cradles and protects the wire against contact with the
crossarm without the use of separate protective material.
Use on long spans for greater ground clearance;
and on poles where climbing clearance is needed.

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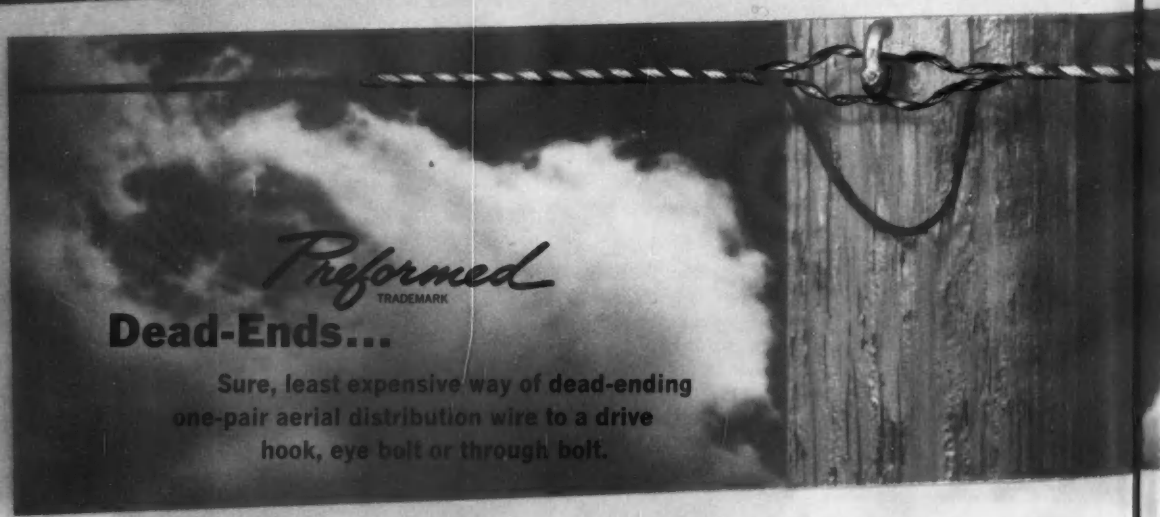
and Standard Loop...
Tangent Supports...
The fast, easy way to protect and separate
two wires on a common drive hook.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Dead-Ends...
Sure, least expensive way of dead-ending
one-pair aerial distribution wire to a drive
hook, eye bolt or through bolt.

For the SAFEST FASTEST SUSPENSION of One-Pair Aerial Distribution Wire (C-Rural)

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FLEXIBLE STAINLESS STEEL NEOPRENE COATED Tangent Supports and Dead-Ends

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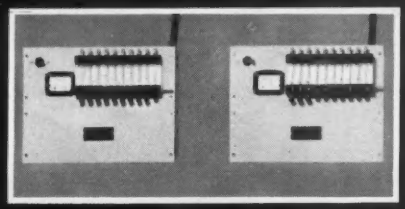


Puregas Pressurized Systems

at work for...

THE UNITED TELEPHONE COMPANY OF PENNSYLVANIA

POST OFFICE BOX 189
236 NORTH SECOND STREET
HARRISBURG, PENNSYLVANIA

J. HOWARD FEDERHOOF
Staff Engineer

April 12, 1960

Puregas Equipment Corporation
578 Oak Street
Copiague, L.I., New York

Dear Sir:

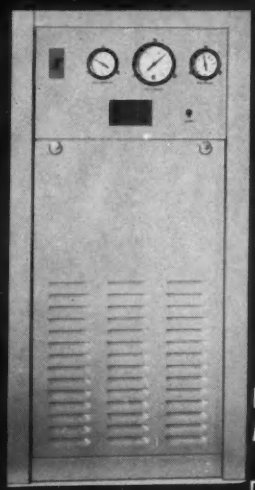
We have been well pleased with the results we are receiving from Puregas Equipment used to pressurize our cable plant. We place all cable, aerial and underground, which includes Exchange, Toll and Combination Toll of various sizes and lengths in a given exchange area under air pressure and have achieved very good results. Our cable trouble caused by water has been entirely eliminated in these areas. Interruption of service on toll lines as well as our subscriber lines is our most important concern and how much this has prevented, we cannot begin to estimate.

One district alone, comprising 130 miles of cable, has been trouble-free of water for nearly three (3) years. The use of air pressure also permits us to locate breaks in the sheath, bad joints and bullet holes before they can cause trouble. As a result of this, our cable plant is kept in A-1 condition and permits us to do this work in good weather and during regular working hours, thus eliminating overtime for clearing and repairing cable trouble.

Based on our past results we propose continuing our air pressure work until all the cables are under air.

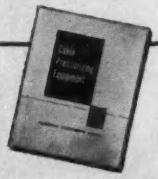
Very truly yours,
J. H. Federhoof
Staff Engineer

JHF/ajr



Model 1500
Air Dryer

The United Telephone Company of Pennsylvania has installed or ordered 24 Puregas Air Dryers to date . . . to find out how your exchange can just about eliminate emergencies with a low cost Pressurizing Program, send for the complete Puregas "Cable Pressurizing Equipment" Catalog.



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YEARS AHEAD IN FREQUENCY STABILITY

Precision frequency stabilization is a Collins tradition. In microwave systems, stabilization is achieved with the use of no-drift frequency reference cavities, regulated voltages and close klystron temperature control. With optional Automatic Frequency Control, tolerances are less than half the ±.05% FCC requirements and within the limits of new regulations effective in some bands in 1961. Interchangeable reference cavities are available at additional cost to achieve ±.005%. For details, write Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

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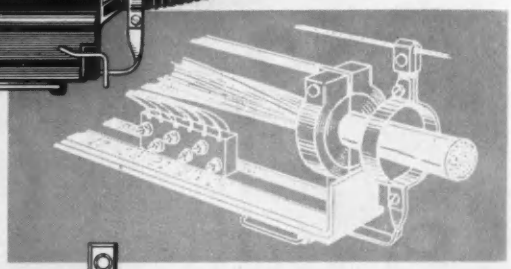
Cook Electric Company

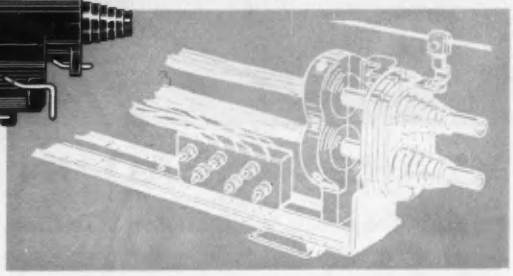
Offers **The most complete line of TERMINAL-SPLICE ENCLOSURES FOR PLASTIC CABLE**

These versatile, neoprene enclosures are for use on plastic sheathed aerial cable to provide weather tight covers for cable splices, termination, protection equipment and encapsulated loading coils.

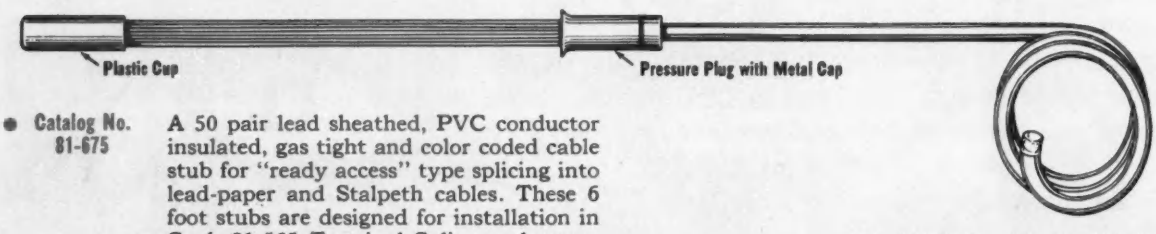
They feature easy accessibility, straight through and branch splicing, and are easily re-opened for re-arranging drops or for maintenance operations.



● **Catalog No. 81-250** — A heavy duty enclosure 28 inches long for plastic cables from 1 inch to 2.2 inches in diameter. The unit is furnished complete with all the necessary hardware.

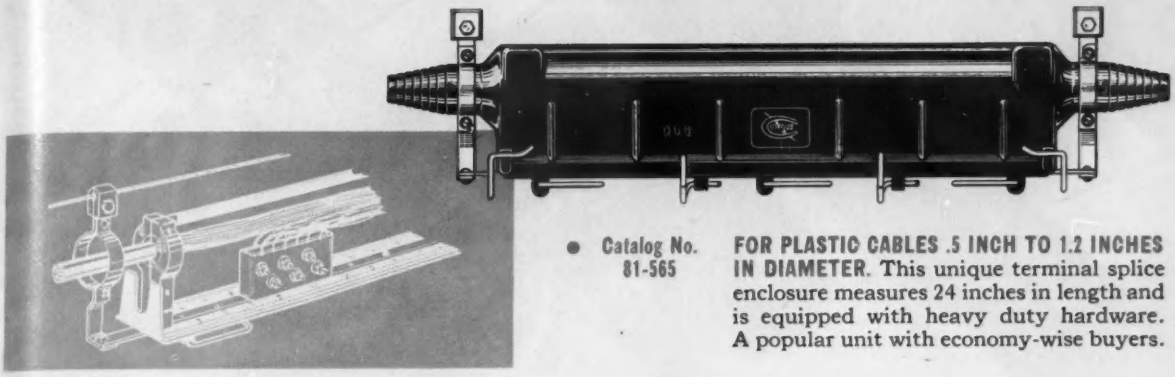


● **Catalog Nos. 81-417 81-418** — These units measure 25 inches in length and are also heavy duty enclosures. 81-417 is for main and branch cables .5 inch to 1 inch diameter, and 81-418 is for 1 inch to 2.2 inch plastic cable diameters.



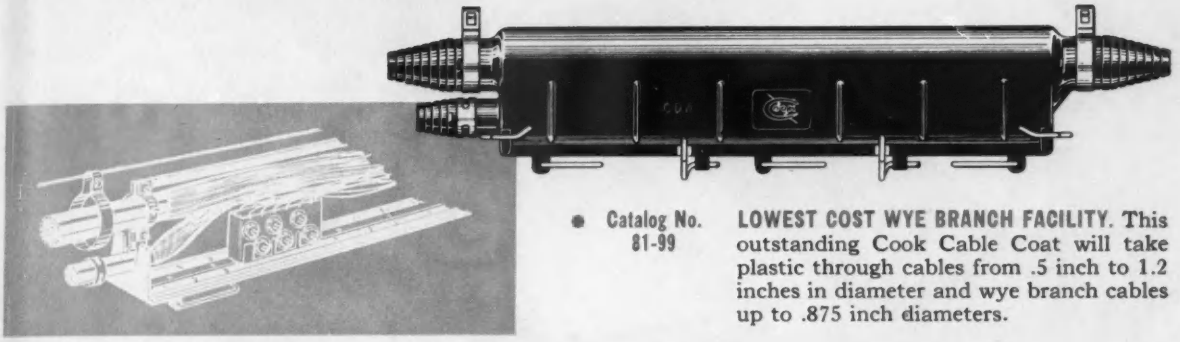
● **Catalog No. 81-675** — A 50 pair lead sheathed, PVC conductor insulated, gas tight and color coded cable stub for "ready access" type splicing into lead-paper and Stalpeth cables. These 6 foot stubs are designed for installation in Cook 81-565 Terminal Splice enclosures.

● **Available Through Your Local Distributor**



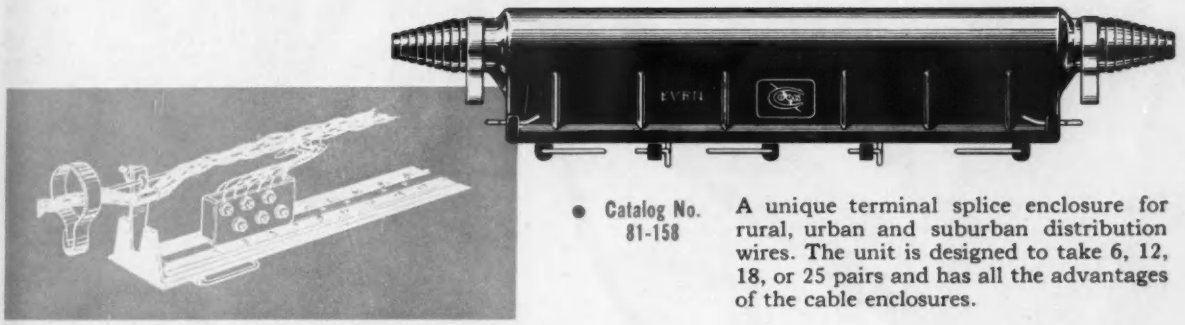
● Catalog No. 81-565

FOR PLASTIC CABLES .5 INCH TO 1.2 INCHES IN DIAMETER. This unique terminal splice enclosure measures 24 inches in length and is equipped with heavy duty hardware. A popular unit with economy-wise buyers.



● Catalog No. 81-99

LOWEST COST WYE BRANCH FACILITY. This outstanding Cook Cable Coat will take plastic through cables from .5 inch to 1.2 inches in diameter and wye branch cables up to .875 inch diameters.



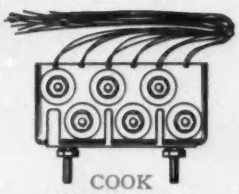
● Catalog No. 81-158

A unique terminal splice enclosure for rural, urban and suburban distribution wires. The unit is designed to take 6, 12, 18, or 25 pairs and has all the advantages of the cable enclosures.

COOK ALSO OFFERS A FULL LINE OF TERMINALS AND LOADING COILS

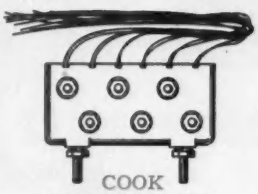
COOK PROTECTED TERMINAL BLOCKS

Furnished in 3, 6, and 16 pair with 41-285 Minigap .005″ gap or 41-610 Minigap .010″ gap.



COOK WASHER-GAP TERMINAL BLOCKS

A 6 pair protected terminal block that can be ordered with or without leads.



COOK UNPROTECTED TERMINAL BLOCKS

A 6 pair unprotected terminal furnished with or without leads.

COOK LOADING COILS

Hi-Fi loading coils. Furnished in 1 to 25 coil sizes, with REA approved color coded leads.

COOK ELECTRIC Company

Since 1897

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HAVE YOU HEARD ?
Anaconda's New Sycamore
Plant has everything we need !

"We can get all our cable needs from Anaconda's new plant at Sycamore, Illinois. They make a complete range of Alpeth and Direct Burial telephone cable and distribution wire, and stock a full range of Stalpeth and Paper Lead Cable."

"Great! Having all those stocks available from Anaconda means fast delivery to the job!"

Good news bears repeating. Anaconda has built a new plant at Sycamore, Illinois, to provide greater convenience and faster delivery for the Independent Telephone Industry. Another service from Anaconda Wire and Cable Company, 25 Broadway, New York 4, N. Y. Dept. EFL-2TEM

PHONE THE MAN FROM

ANACONDA®

FOR TELEPHONE WIRE AND CABLE

THE INDEPENDENT MANUFACTURER FOR THE INDEPENDENT TELEPHONE INDUSTRY

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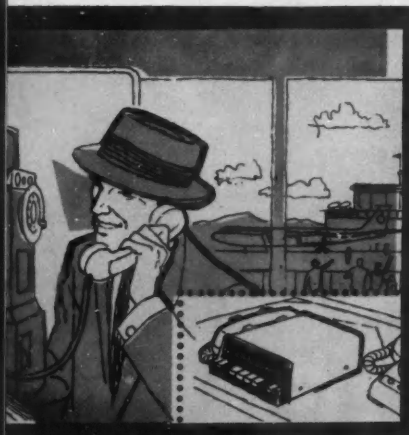
ITT **KELLOGG** brings yo

NEW REMOTE CONTROL FEATURES



RECORDING. Announces in your own voice any message up to three minutes, which you want your callers to receive. Amazing remote control signal lets you change your announcement message from any outside telephone as often as you like.

PLAYBACK. Plays back recorded messages left by callers. Remote control signal lets you (and only you) hear all recorded messages when you call in from outside telephone. Each time you signal for messages you hear only the new messages left since your last call.

DICTATION. Use CODE-A-PHONE as dictation machine in the office or from any outside telephone. Eliminates need for separate office dictation machine. Frees you from taking any dictating machine home or on business trips.

DISTRIBUTED TO THE INDEPENDENT TELEPHONE

he amazing

NEW TELEPHONE DICTATING, RECORDING AND ANSWERING MACHINE INDEPENDENTS HAVE WAITED FOR

the totally automatic

Code-a-phone®

WITH REVOLUTIONARY CODE RELAYS THAT PERMIT SUBSCRIBER TO

- TELEPHONE-IN NEW ANNOUNCEMENTS
- HEAR MESSAGES FROM OUTSIDE
- DICTATE—EVEN BY PHONE
- FILE PHONE CONVERSATIONS

NOW you can offer your subscribers a top quality telephone answering device that meets telephone company standards—and at a price everyone can afford. Unique code relay permits user (and ONLY the user) to call in new announcement messages or play back messages. Lifelike sound. Special tape cartridges can be kept on file. Models for every application, every size company.

NEW VERSATILITY

CONFERENCE CALL CIRCUITS. Records conference calls including all incoming and out-going voices. Each office using CODE-A-PHONE has an immediate tape cartridge recording of the complete conference which can be transcribed or filed for future reference.

MONITORS CALLS. Monitors incoming calls so that you may interrupt machine and talk directly with any caller. Small built-in speaker lets you hear incoming voice and your recorded announcement while you work.

TRANSMITS MESSAGES. Transmits prerecorded message or reports to another person or distant CODE-A-PHONE. Tape cartridge provides permanent record of complete transmission.

NDUSTRY EXCLUSIVELY BY:

MANUFACTURED BY CODE-A-PHONE ELECTRONICS, INC.

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FOR COMPLETE INFORMATION, WRITE TO:

KELLOGG

A Division of International Telephone & Telegraph Co
6650 South Cicero Avenue, Chicago 38, Ill.
Attention: Marketing Department

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anufacturers of telephones, switchboards and related apparatus since 1907

Spring Construction and M

1961 FORECAST*

GAINS IN STATIONS

INCREASED CONSTRUCTION

SOARING REVENUES

RISING PLANT INVESTMENT

*TELEPHONE ENGINEER & MANAGEMENT'S 1961 Survey of operating data supplied to TE&M's Research Department by 404 of the nation's Independent Telephone companies, representing 64.3% of the Independent telephones in service, 67% of the Independent industry's plant investment, and 69.7% of the Independent telephone industry's operating revenues, indicates the companies expect (1) station gains to continue; (2) operating revenues to rise; and (3) mounting expenditures for service improvements.

Gross construction additions to the outside plants of the reporting companies amounted to $112,50,547 in 1959. During 1960 outside plant additions totalled $125,967,253, up $13,516,706 from 1959. In 1961 the reporting companies expect gross construction additions to the outside plant to total $131,653,107, an increase of $5,685,854 over the additions made in 1960.

The growth pattern of total telephone industry construction additions shows a healthy upward curve, and based on the data provided by 404 telephone companies there are no prospects currently visible which would indicate a significant downturn in the industry's construction trends.

In 1959 the total gross construction additions of companies reporting to TE&M were $331,585,428. In 1960 the companies reported gross additions of $352,278,181, for a gain of $20,692,753. For 1961, the companies forecast that construction additions will rise to $386,318,214, up $34,040,033 from 1960. — (See January 15, 1961 Telephone Engineer & Management.)

An Up-To-Date Working Tool for Telephone Operating Men and a Timely Sales Aid for Manufacturers of Telephone Equipment and Supplies

This "Special" will present in one big issue articles and feature departments discussing the telephone industry's newest construction and maintenance practices — the routines and procedures, telephone companies will use in 1961 to complete the industry's $3 billion expansion-improvement program and maintain the industry's $26 billion plant investment.

New Products — Labor Saving Ideas

Aimed at presenting information that will provide telephone men with new ways and means . . . plus . . . presenting new equipment available for coming construction-maintenance projects, the exclusive articles described on the next page will be featured in the April 15 "Spring Construction Special."

prepares another important "SPECIAL"

Maintenance Issue.... APRIL 15

Getting The Most From Your Construction Dollars ..... by John S. Reed

Expansion programs to bring telephone service to new housing areas, increasing toll usage requiring toll circuit additions, and highway building and widening projects result in increased outside plant construction expenses. Labor saving ideas are needed to hold these costs in check. Some of the more recent ideas discussed in this article are:

(a) Improved pole moving procedures

(b) Use of aerial lifts and hydraulic derricks to improve labor performance and reduce construction accidents

(c) New type of crew carrier to reduce transportation time of construction crews

(d) Use of three-man construction crews, and

(e) One-man cable splicing operations

Maintenance Procedures That Eliminate Trouble Reports ..... By Richard Allen

An increasing number of trouble reports over a period of time is a danger sign to the telephone company manager or plant supervisor that the outside plant and inside equipment is deteriorating. Good maintenance procedures are needed to reduce trouble reports to a favourable minimum. This article reviews methods of promoting good maintenance practices that detect incipient cases of trouble while they are in the process of developing, and before they can cause service interruptions. It points out the importance of following manufacturers' routines for central office maintenance.

Stop Spring Construction Accidents ..... By Myrle Shafer

Not every accident results in injury to the worker involved. In many cases, it is a near-miss with perhaps nothing more than a big scare for the men; but expensive equipment may be disabled or destroyed, and property damage may result with a costly claim for the company to meet. Yet, when a mishap causes injury, other factors besides money cost enters the picture, such as human suffering, loss of earning power, and lowered morale of the injured worker, all of which affect company operations to an adverse degree. Telephone company managers, supervisors, and workers have the responsibility for keeping mishaps from occurring by following safe working procedures. Thus, for telephone construction forces, work areas must be adequately protected from vehicular traffic, proper precautions must be utilized in working near power lines, climbing and working on poles, and in placing wires and cables.

Plant Men Look Over The Compact Car Field ..... By Dick Reynolds

A TE&M staff report on the use of small light-weight vehicles by telephone companies. This article describes the merits of the compact cars and gives data on:

(1) Original costs

(2) Operating expenses, and

(3) Maintenance procedures.

The Cenral Office Part In The Construction Program ..... by C. D. Ehinger

This article describes the important part members of the Central office staff play in the completion of the outside plant construction program — tells what the Central Office group must do and suggests routines that will speed up each project.

In addition to the five major articles described above, TE&M's regular departments — "Commercial Department Notes," "Plant Engineering Notes," "Traffic Lights," "New Products' Showcase," and "Keeping Up With Communications" will discuss subjects related to construction and maintenance.

WHAT COULD BE MORE LOGICAL?

It is man's inherent nature that progress engenders progress, that improvement breeds improvement. So, it was only natural that when the first automatic dialed telephone call was completed, far-sighted telephone engineers began to envision the day when all calls—including toll calls—would be made automatically.

First, it was necessary to make long distance communications practical. With the invention of the vacuum tube, it became possible to achieve efficient transmission over great distances.

With this obstacle overcome, the problems became more specific.

"If we are to achieve automatic toll calling," engineers determined, "we must develop equipment to replace the toll operator."

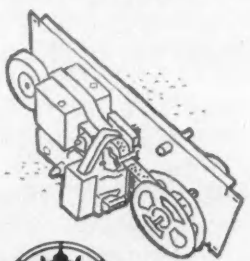
Even before such equipment could be developed, however, it was necessary to establish a philosophy upon which the design of such equipment could be based. Numbering plans and area codes had to be worked out. An over-all master plan had to be evolved that could eventually serve as the skeletal framework for a completely integrated network, nationwide in scope and practical in everyday application.

Basic premises for equipment design established that automatic toll handling must be accomplished with such simplicity that subscribers could and would dial their own toll calls and that the equipment could perform operator functions more quickly and efficiently than an operator

At North Electric, both the broad concept and the application problems were recognized. Working toward a now visible goal, with a full understanding of where the Independents would fit into this still envisioned DDD network, North engineers developed, installed and cut-over one of the first Independent commercial automatic toll ticketing networks. This was no experimental installation. It is still working today!

North engineers, working from this broad base of experience, have improved and refined North AuTollizer® equipment so that today, as for the past decade, no other automatic toll ticketing equipment can perform so efficiently and so profitably for you.

If you're planning automatic toll handling, look first to...



THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

GALION, OHIO

NORTH

No. 1 in a series of factual presentations on North AuTollizer.

TELEPHONE ENGINEER
AND MANAGEMENT'S

EDITORIAL

COMMENT

"Time For Excise Tax Relief"

OUR VIEWS on terminating the unfair and discriminatory 10 percent excise tax on local telephone service have been presented in several previous editorials.

In brief, our editorials urging the repeal of the telephone excise tax have pointed out *the tax is not only a burden on all telephone subscribers — residential and business — but is a tax on a service that is a daily necessity . . .*"

Today, that view applies to the existing 10% excise tax on local telephone service with even greater emphasis. The telephone is an absolute necessity. It is an indispensable household facility. It is as much a needed utility as electricity, gas, or water, and in our book, at least, there is no justification for singling out the telephone from all the vital utilities for taxing purposes.

We well remember the days when an excise tax was imposed on electrical energy. In 1951, the last full year of its existence, the tax produced over $93 million for the government. Yet, despite this substantial tax revenue loss, the tax was repealed by the Revenue Act of 1951, although the same Revenue Act increased many other taxes, and some new taxes were brought into being because of the Korean hostilities.

It is interesting to note that the report of the House Ways & Means Committee on the Revenue Act of 1951, justified the repeal of the excise tax on electrical energy by saying (in part) "*. . . the tax is believed to be one of the most burdensome of the excise taxes with respect to the lower income groups, since amounts paid by consumers for electrical energy tend to vary relatively little with variations in income. . . .*"

Congressman Wilbur Mills (D., Ark.) added to this thinking in 1957 when he told a convention of the Arkansas Telephone Association "*. . . With unlimited local telephone service available for a flat monthly fee, the lower income user often bears the same tax burden as the high income user. Such a result constitutes regressiveness in its most objectionable form. It is contrary to the basic taxing concept which should prevail — that of imposing taxes in proportion to the ability to pay.*"

From there Congressman Mills went on and presented a few facts that are even more applicable today than when he addressed the Arkansas convention. "*. . . With the total Federal tax burden on the average individual being as high as it is now because of all the direct and indirect taxes,*" he said, "*every bit of tax saving is a help. Even a telephone tax saving of $10 a year would be noticed by, and helpful to, the mass of low income subscribers. The effect of such a repeal surely would be felt in the diversion of the tax saving to purchases of other goods and services, thereby aiding the nation's business. . . .*"

Certainly it is high time members of the telephone industry and telephone users reactivate such thoughts and present them to their Congressmen.

We admit both groups — the industry members and the telephone subscribers — have good cause to wonder if the Congress and a Federal Administration will ever be disposed to agree to terminate the "temporary (?)" excise tax on telephone service. The end result of Washington's perennial discussions and consideration of the subject are not encouraging.

However, in 1960 Congress did set a *new June 30, 1961 date for the termination of the 10-percent excise tax on local telephone service*, and despite the records of the past which have made a "*temporary tax*" take on a suspiciously "*permanent*" appearance, we believe 1961 can be the year the *mail from home* will convince Washington that a *promise is a promise.*

Without such "*mail from home*" this coming June 30 may well find the telephone subscribers of this country still saddled with a "*temporary, wartime tax,*" that has taken another step toward becoming permanent. Of that we are sure!

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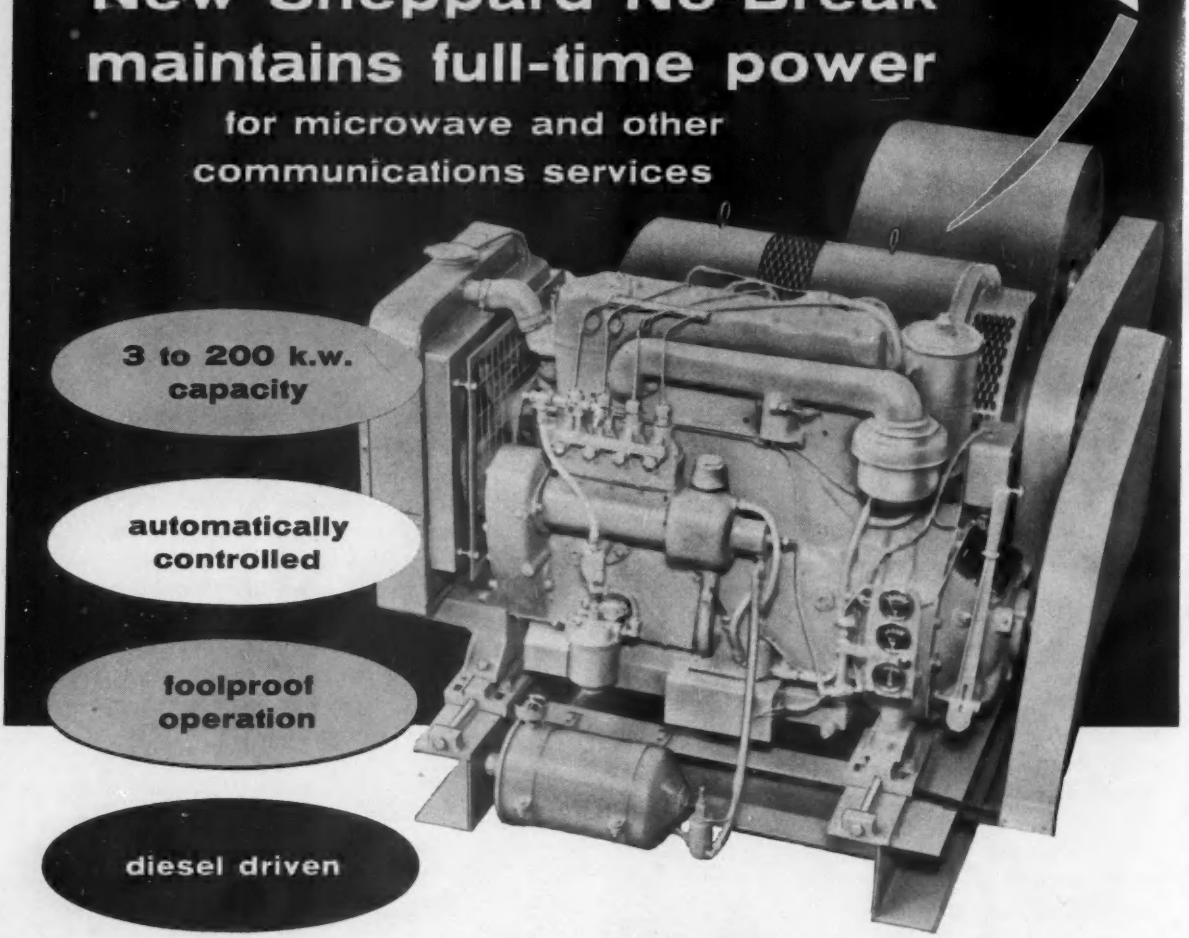
an important message for the communications industry...

New Sheppard No-Break maintains full-time power

for microwave and other communications services



3 to 200 k.w. capacity

automatically controlled

foolproof operation

diesel driven

Assures positive protection against power failure or voltage drop where continuous full power values are essential.

The new Sheppard No-Break, as described by J. S. Reed in an exclusive article for the February 15 issue of Telephone Engineer, is a development of significant importance to the communications industry. It was developed specially for the many applications where the slightest power interruption can damage costly equipment or interrupt vital services. The new Sheppard No-Break not only provides positive protection against total power failure, but automatically takes over *before* prime power voltage or frequency drops below acceptable values. The changes in power values from the moment of prime power failure until the Sheppard No-Break is carrying the full load are so slight as to be practically negligible.

The operation of the Sheppard No-Break is dependable . . . foolproof . . . and fully automatic. It is a proven answer to the vexing power problem facing the communications industry today. Literature is available giving complete performance data and information.

get a line on **Sheppard**

NO-BREAK GENERATING SETS

Write R. H. SHEPPARD CO., INC., HANOVER, PENNSYLVANIA

TELEPHONE ENGINEER
AND MANAGEMENT'S
WASHINGTON
OBSERVATIONS

A.T. & T. Proposes New "Telpak" Service

BROADBAND ELECTRONIC HIGHWAYS

Customer could use Telpak channels to send telephone, telephotograph, facsimile, teletypewriter, data transmission, remote metering, supervisory control, and miscellaneous signaling transmissions . . . Service could be one-way or simultaneous, with objective of providing same flexibility and adaptability as private microwave systems, with competitive prices . . . Four types of service provide equivalents of 12, 24, 60, and 240 telephone grade channels . . . Sharing arrangements comparable to those available now with private microwave.

By ROLAND DAVIES and FRED HENCK

A TARIFF offering of broadband "electronic highways" which could be used by customers to transmit almost all types of communications, known as Telpak, was filed by the American Telephone & Telegraph Co. Long Lines Department with the FCC Monday, Jan. 16, to become effective Wednesday, Feb. 15.

The Telpak service, in four classifications ranging in capacity from the equivalent of 12 voice channels to the equivalent of 240 voice grade circuits, is intended to give large business and government communications users a realistic choice between common carrier services and private microwave systems.

The full-time Telpak service, to be available on a seven-day, 24-hour basis, on a one-month minimum, would enable the customer to send, over the broad bands to be furnished, telephone telephotograph, facsimile, teletypewriter, data transmission, remote metering, supervisory control, and miscellaneous signalling transmissions.

Service will be provided for one-way transmission, or for simultaneous transmission in both directions, and for any combination of interstate and intrastate services. Objective is to provide at least the same flexibility, and adaptability to handling bulk communications, now present in private microwave systems, and at prices which are competitive.

Intrastate Tariffs Filed In Four States

INTRASTATE tariffs have been filed in four states — New York, South Dakota, Mississippi, and Michigan — and will be filed in other states as customer needs and local conditions warrant.

The four types of service, designated A to D, are for the equivalents of 12, 24, 60, and 240 telephone grade channels. In terms of carrier spectrum assignment in kilocycles per second, they are 48, 96, 240, and 1000, respectively.

Mileage charges for the 12-voice gradepath, Telpak A, would be $15 per month per airline mile. For the other three, the per airline mile per month charges would be $20, $25, and $45, respectively.

Monthly charges per channel terminal would be $15 for telephone, $15 for teletypewriter, $60 for telephotograph, $15 for schedules 1, 2, and 3 data, and $15 for type 4 data. In each instance, the installation charge would be $10. For type 4A data, on a two-point channel not arranged for switching, the monthly charge would be $25, while on a two-point channel arranged for switching or on a multipoint channel, the monthly charge would be $35. Installation charges for the latter two would be $20 and $35, respectively.

For schedule 5 data channels, the channel terminal charge is $235, with a $10 installation charge.

Three other channel terminals are listed, designated types A1, C1, and D1 (high speed data), A1 and C1 will have bandwidths from zero to approximately 20,000 and 100,000 cycles per second, respectively. The D1 terminal is specially adapted to accommodate seven-level high-speed magnetic tape transmission at a rate of approximately 500,000 bits per second.

Rates for the latter three are $100,

$130, and $1300, respectively, with installation charges of $70, $90, and $900, respectively.

Sharing arrangements provided in the tariff are intended to make the service comparable with what is available from a private microwave system in this regard.

The tariff provides that "Shared use of Telpak channels, but not of derived channels, is permitted in the case of the following: (1) pipeline companies, railroad companies, and other common carriers or public utilities whose rates and charges are regulated by a government entity, provided that those involved in such shared use are in the same line of business; (2) government agencies (federal, state, and local). Customers sharing Telpak channels shall designate one such customer as their agent to place all orders for service over the shared facilities.

"Charges will be computed as though the facilities were furnished to a single customer and, without affecting the ultimate responsibility for payment of charges, will be billed under either of the following options as designated by the sharing customers: (1) the total charges will be billed to a single customer; (2) charges will be allocated for billing purposes among the customers in accordance with percentages specified by them . . ." There will be a billing service charge of $5 per month for each billed customer on an allocated basis.

For the second or subsequent stations in an exchange on any individual channel of service, monthly charges for telephone, teletypewriter, telephotograph, and the various classes of data channel terminals will be in the $5-15 range. Installation charges would be $10, except that a $20 charge would be applied to type 4A channel terminals.

Settlement Procedures Discussed With Independent Companies

DISCUSSIONS of the proposed service were held in advance with representatives of Independent telephone companies, and there does not appear to be anything resembling the settlement situation which took place in connection with the Bell System's first of two major new services proposed in barely more than a month — wide area telephone service.

In fact, the U. S. Independent Telephone Association advised its members last month that settlements for the new type of service have been discussed with Bell System representatives by the USITA Settlements Committee's subcommittee on special services. While recommended settlement arrangements have not been made final, the USITA members were told, "Pending development of jointly recommended settlement plans, Independent companies are encouraged to participate in the joint provision of this service with Bell System companies and other Independent companies."

The statement added, "Where Independent companies concur in the Bell companies' filed tariff, settlements based on the Independent companies' full costs of providing the service would seem applicable."

From the Bell System point of view, likewise, it is felt that principles which recognize Independents' costs and a reasonable return on investment, as in the joint industry recommendations for handling private line, SAGE, and video service settlements, would also be applicable to Telpak.

As explained in the letter of transmittal from Long Lines Administrator Rates & Tariffs L. E. Eastmond to the Commission, the telephone company "will provide channelizing equipment to subdivide Telpak channels into channels of lesser width — derived channels — or will terminate the entire Telpak channel for use of a broadband transmission medium."

Listing the four Telpak service classifications, Mr. Eastmond commented that "These classifications provide a range of channels which offer wide flexibility in meeting customers' needs and are consistent with the characteristics of the new types of transmission systems. A family of channel terminals is offered to accommodate existing customer service needs.

"The rate structure is in two elements: a flat monthly rate per mile for the basic transmission path and monthly rates for terminating the channels at the customers' premises. Monthly charges vary with the size and length of the Telpak channel and with the type and number of circuit terminations provided.

"It is estimated that present customers for services furnished under other tariffs of this company will be able to effect savings in charges ranging between $6,000,000 and $12,000,000 annually, depending upon the extent to which they may be able to rearrange their service orders to take advantage of the new offering."

Regarding connections with Independents, Mr. Eastmond advised the FCC that "As of this date, concurrences have been obtained from the Bell System companies and a few other telephone companies. Additional telephone companies are being contacted and it is planned to request special permission to file on less than statutory notice such concurrences as are received by Feb. 5. Also, permission will be requested to file on less than statutory (30 days') notice the list of states in which combinations of interstate and intrastate channels may be obtained."

Basis for the Telpak service, it is understood, is the need for a new service to meet the large, growing requirements of industry and government subscribers for large volume communications systems between specified points. It has become evident that services for transmitting data and other volume services are showing a greater growth rate than private line voice or telegraph.

Too Early To Assess The Impact On Usual Services

WHILE it is too early to assess fully the impact on usual common carrier services of the FCC's microwave policy decision, making possible broadscale licensing of private point-to-point systems, it is anticipated that the demand for private systems in the wake of the FCC policy ruling will be analogous to the development of motor transportation following government highway improvement programs. Common car-

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Part Three of A
Special TE&M Report

REGULATION AND THE INVESTOR

CONCERNED WITH THE FUTURE

Future service improvement and future growth depend on provision of funds by investors, and the willingness of the investor to provide these funds depends on his confidence in the future earnings of the utility. (Continued from the January 1 issue.)

By JOSEPH J. BROWN*

MY FIRST two articles in this series did not mention the investor. This article will, therefore, examine his role in providing utility service.

It goes almost without saying that the investor is the source of service, for he provides the plant required to serve.

The courts have always recognized this. Much of the testimony in rate cases concerns the question of what the investor expects and should properly receive in return for his investment. While this testimony is sometimes technical and confusing to the layman, there is sound reason for close attention to the investor and his return. For the financial breakdown of a utility can be more damaging to the service than most other failures a utility must guard against.

The investor and the future have a peculiar identity under regulation. Future service improvement and future growth depend on the provision of funds by the investor. And the willingness of the investor to provide these funds depends on his confidence in the future earnings of the utility. Thus both the viewpoint and the function of the investor are concerned with the future. His actions are affected by his judgement of the future, and he in turn affects the future by his actions.

Regulator Must Focus His Attention On The Future

THIS adds further emphasis to the point made in my first article — that regulators must focus their attention on the future, not the past. In fact, by his unusual position of influence, the regulator has a rare opportunity to help form the future. A regulator who views the investor solely in terms of the past misses this opportunity.

Yet the opportunity is hard to grasp. By and large, the facts available arise from the past. The regulator is, therefore, challenged by the need to use foresight while most of the facts on hand come from hindsight.

The temptation to forget and focus on the past is strengthened by the desire of some people to find a formula by which utility earnings may be regulated in a sure and foolproof way. It seems doubtful to me that such a formula can ever be found. Since the future is unknown, and accelerating change is the outstanding characteristic of our economy, it is clear that sound judgment has more value in regulation today than any formula based on past facts can possibly have.

Change In Character Of The Investor

ANY discussion of the investor would be incomplete if it failed to recognize current changes in his character. In years past the investor was commonly an individual with a large private fortune to invest. But the investor of rising significance today, particularly with respect to bonds, is a professional, who handles the massive funds of life insurance companies, investment companies and pension funds.

Mr. Brown is chairman of the Nebraska State Railway Commission.

Life insurance companies now own about $51 billion of corporate securities. Pension funds own more than $25 billion, and mutual investment companies nearly $23 billion.

The holdings of these institutions are still far surpassed by the $400 billions of securities held by individuals. But in new purchases, the relationship is reversed.

Since 1950 the three institutional groups above have bought a net of more than $47 billion of securities, while individuals have bought only $16 billion. In this period the holdings of life insurance companies have nearly doubled, pension funds more than tripled, investment companies risen more than a third, while individual ownership of corporate securities has gone up only four per cent.

Clearly new money for corporate expansion and improvement now comes largely from institutional funds. The point is that the investor of today is increasingly sophisticated, with the most searching investment analyses at his fingertips. He is not attracted by folklore from the past, but by carefully studied prospects for the future.

What The Investor Looks For and Expects

WITH this in mind, the next question is what the investor looks for in an investment. This is the question explored in so much rate case testimony, as I have mentioned.

In considering this matter, it is impossible to escape the impact of inflation on investment. Managers of utilities always stress inflation in rate cases. And regulators express increasing concern.

The 1959 report of the NARUC committee on corporate finance said, "With the outlook for continued inflation, more attention is being given to this subject than ever before and utilities will have to offer their investors opportunities commensurate with alternative investments in order to obtain the necessary funds."

Many national leaders now consider a little inflation perfectly normal — even desirable. They speak of two or three per cent a year as if it does not amount to much. Yet compounded year after year as it must be, this creates a 22 per cent to 34 per cent loss in the buying power of the dollar in ten years. Over twenty years it brings a loss of 49 per cent to 81 per cent. I see little real effort being made to halt this.

"As of now, any expectation of abatement of inflation would appear to be nothing but a wishful triumph of optimism over experience," Paul E. Weiland, Director of Utilities for Ohio, remarked recently.

This prospect for inflation has led investors to look with increasing disfavor on fixed value investments, such as bonds. The officer in charge of investments for one large life insurance company has stated, "In the last eighteen years . . . the holders of all of the bonds of a large segment of the public utility industry, including the electric and telephone companies, have actually received a negative return on their investment. The total of all interest paid on these bonds over that period has hardly been sufficient to offset the loss in their principle value due to inflation."

It was disturbing to see how vigorously this point of view was expressed by a panel of investment men before the Edison Electric Institute last June.

The Senior Vice President of Guardian Life Insurance Company of America went so far as to call utility bonds a "heads you win, tails I lose" proposition. He said the primary market for utility bonds today is state and local pension funds, which are "so hedged in by legal restrictions that they have little or no option to enter the alternative fields available to other investors."

He concluded that "you (electric utility executives) have been enjoying the fruits of a trapped and unsophisticated market. The question is — how long will you be able to enjoy these fruits?"

Another investment man appearing on the same panel added two other causes for concern. He suggested that some buyers already have as many utility securities as they want. He called this difficulty "particularly acute as to the big companies, some of which are already paying more for their capital than their credit warrants because buyers will take additional offerings only at price concessions."

He also mentioned intense rivalry for funds from real estate mortgages, securities of other types of corporations, and tax-exempt government bonds. He expects the last of these to soak up large sums of money in the years ahead as explosive population increases require financing of huge public works expansions.

While inflation has affected the market for bonds, it has had equal impact on the investor in stocks. A survey of shareowners published recently by the New York Stock Exchange said two-thirds of those surveyed view their stock investments as protection against inflation. This was also born out by participants in the electric financial panel mentioned above, who emphasized that today's investor in common stocks looks primarily for growth in earnings per share.

In view of this, it was disturbing to note recently the rather acid reference of Fergus J. McDiarmid, investment vice president of Lincoln National Life Insurance Company, to "a public utility common stock which behaves like a junior preferred."

If it were not for the need of utilities for continuing huge amounts of money for growth, remarks like these would not be so troubling. But the figures speak for themselves.

Since the war, utilities have sold half of all the new security offerings. Their growth is at a faster rate than the rest of the economy. And there is no sign that it will not continue. After all, utility services are basic to the growth of all business. In fact, as growth compounds, utilities may well need more money, rather than less, to do their job in the future.

This leads to the question of whether capital will be

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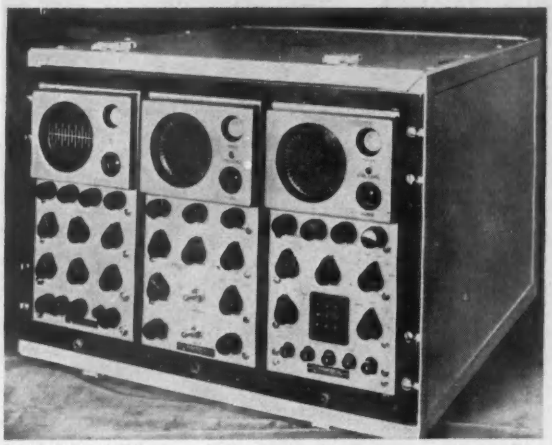

FIGURE ONE: — Telegraph distortion measurement system (TDMS) equipment.

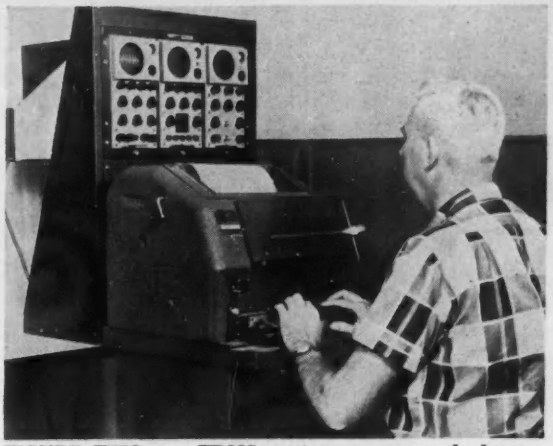

FIGURE TWO: — TDMS equipment mounted above a standard teletype machine.

Evaluation of Communication Links Without Interrupting Service

By JOHN S. REED

WITH THE rapid increase in data processing systems and the growing need for reliable communication circuits to transmit high speed data signals, the telephone industry is becoming aware of the need for accurate testing equipment to check causes of distortion in these circuits. Such circuits must be free of error-creating conditions if data signals are to be accurately transmitted.

The telegraph distortion measuring system (TDMS), an English development by the Automatic Telephone Electric, Ltd., and manufactured and marketed by Radiation, Inc. in America under license, is designed to provide continuous monitoring of telegraph and data circuits. It is said to be capable of pinpointing the type and source of trouble as it occurs, and thereby reduces down-time of circuits and improves quality of service.

This system has the unique feature of enabling on-line evaluations of operating communication links without interrupting service. The new equipment provides perfect telegraph test signals, inserts predetermined amounts of start-element distortion into teleprinter test signals, makes up to 50% distortion measurements of incoming telegraph and data signals, furnishes non-ambiguous readings by spiral-trace presentation on oscilloscopes and analyzes line wave shapes on an oscilloscope. It has the ability to test start-stop mechanisms including regenerative repeaters and provides for testing and adjusting of relays used in modern telegraph systems.

The TDMS is said to be capable of replacing most test equipment now required for teleprinter terminal maintenance and monitoring, resulting in reduced test equipment costs, increased efficiency, and reduced circuit outage.

As shown in *Figures One* and *Two*, the apparatus consists of a teletype signal transmitter, signal receiver and an oscilloscope (Tel-A-Scan). Each of these units can be operated as a portable item, using auxiliary power supplies, or side-by-side in a three-slot frame that mounts in a standard 19 inch relay rack which includes a master power supply.

Transmitter Unit of TDMS

THE transmitter unit is, primarily, a telegraph test-signal generator which transmits six different types of telegraph signals at any modulation rate ranging from 50-60, 60-80, to 140-160 bauds. (A "Baud" is the usual measure of telegraph speed, represented by the reciprocal of the length of one character element. Thus, for a system where each element is 20 milliseconds long, the baud-speed is $1000 \div 20 = 50$ bands.)

The code transmitted consists of a start-element, five character elements, and 1, 1½ or 2 stop elements. Up to 50 percent short or long start-element distortion can be introduced into any test transmission.

The transmitter measures the distortion present in a test-signal generated by the unit, itself, or measures the speed and distortion of signals received from local or distant external sources. Facilities also are provided for testing and adjusting telegraph relays.

A visual indication presented by a circular-trace on the face of the cathode ray tube shows the bias state, contact bounce, and transit time percentage of the relay. The effect of the adjustments can be observed while these adjustments are actually being made.

Normal modulation rates ranging from 40-60, 60-80, and 140-160 bands are provided by the TDMS transmitter. A slow-motion drive is fitted to a fine speed control on the front panel. This control has a calibrated dial which allows a selectable variation of 10 bauds above or below the center-point of each speed range. A built-in neon speed-indicator light enables the speeds to be set accurately when it is strobed against a standard tuning fork. Speeds are controlled by a high-stability oscillator approximating one part in 10^3 for long periods, and five parts in 10^4 for short periods.

A visual "picture" is provided by a cathode ray tube using a circular time-base display. Partial capabilities of this display mode allow selective investigation of outgoing or incoming signals. On this display, each change-over appears as a bright dot. The speed of an incoming signal thus may be measured by adjusting the speed of the oscillator which also forms part of the time-base until the dots become stationary. Transmission speed is read directly from a calibrated fine-speed dial on the face of the instrument.

In the absence of distortion, all dots will be superimposed. Distortion will displace the dots to form an arc, the length of which is a measurement of the distortion present. The CRT graticule has a circular-scale graduated in fifty equal divisions, with each division representing one percent distortion.

Receiver Unit of TDMS

THE TDMS receiver unit is a special-purpose instrument which enables an operator to continuously monitor and analyze telegraph and data line systems and to pinpoint malfunctionings therein, without interrupting the flow of message-traffic.

The receiver also has limited facilities for measuring the transit-time and contact-bounce of polar relays and similar mechanisms. The receiver indicates the presence of, and measures the degree and type of distortion. The nature of the distortion can most easily be seen and analyzed in conjunction with the waveform display on the Tel-A-Scan oscilloscope unit.

The receiver accepts start-stop or synchronous signals and provides a cathode ray display from which distortion may be read directly. Synchronous signals are displayed on a circular-trace (similar to that of the transmitter), while start-stop signals are presented on a spiral trace. Each character element appears, as a bright dot, on a different spiral loop to aid in the direct measurement of individual distortion. Input signals may be of either polarity. Spiral trace presentations of distorted and non-distorted signals are illustrated and interpreted in *Figures Three* to *Five*.

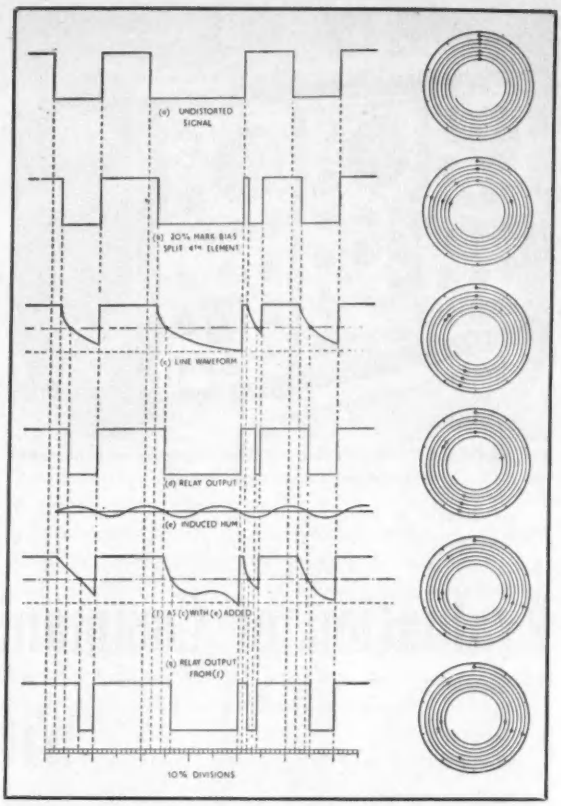
(a) UNDISTORTED SIGNAL
(b) 20% MARK BIAS SPLIT 4TH ELEMENT
(c) LINE WAVEFORM
(d) RELAY OUTPUT
(e) INDUCED HUM
(f) AS (c) WITH (e) ADDED
(g) RELAY OUTPUT FROM (f)
10% DIVISIONS

FIGURE THREE: — Waveform diplays in a typical single-current system is shown on Tel-A-Scan and receiver unit of TDMS. (a) This is the perfect signal for the letter "D". (b) Character badly distorted owing to poorly adjusted sending contacts. (c) When the output in (b) is transmitted over a high-capacitance line to ground, the line-output (representing the current in the receiving relay's line coil assumes this form. The point-of-operation of a bias-free relay is shown, and also the bright points (indicated by black dots in drawing)on the wave form display when the receiver's line-balance control is adjusted so that the instrument operates at this point. (d) This waveform represents output of the bias-free relay operating on the line-current shown in (c). The spiral trace shows 45 percent combined bias and end distortion. (e) Spurious hum being picked up on the line. (f) Adding the above hum to (c) gives a line waveform as shown in drawing. (g) This presentation would be derived from (f) with a bias-free relay.

The beginning of each character element induces the bright dot. With a non-distorted signal,, all dots will form a vertical line. Long or short start signals will displace dots either to the right or the left of the vertical plane line. Bias, characteristic, and fortuitous distortion can be determined from the relative displacement of individual dots. Percentages of distortion in one percent elements are indicated by a circular-scale engraved on the CRT graticule.

Front panel controls are provided to automatically permit simultaneous use of the receiver in direct con-

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COMMERCIAL DEPARTMENT NOTES

By ALLAN R. STACEY
Vice Pres., Sunland-Tujunga Tel. Co., Sunland, Calif.

Invite Your Subscribers In For A Visit

PLANNING YOUR OPEN HOUSE

A well-conducted "Open House" program shows your company is a progressive organization — one that is keeping abreast of modern technology, and is working hard to serve and please subscribers. Among the benefits of "Open House" are: (1) better subscriber understanding of the company's job; and (2) public realization of the investment required to provide good service.

MY FEET were tired and my voice was husky. We had just finished an Open House Visitation by more than 4000 subscribers and their friends. Although very tired, I was also well pleased. The Open House was an unqualified success.

I believe that there are immeasurable benefits to be obtained from inviting the public to see your telephone company. We show them the company's role in providing a vital communication service to the community and to the nation. The company gains recognition as a good neighbor. We display the tremendous investment required to provide good telephone service. We acquaint the public with how our business works. We illustrate the fact that our employes have good jobs and pleasant working conditions.

We show that the company is an important factor in the local economy by stressing payroll paid to the community and taxes placed into the coffers of the local tax collector. We show the subscriber the complexity of his telephone equipment in order to give him a better understanding of service interruptions when they occur.

Finally, we display and demonstrate the company's service and sales items, such as telephones in color, hands free instruments, answering machines and other devices.

In short, a well-conducted Open House program shows that we are a progressive organization — one that is working hard to give customer satisfaction.

Letter From A Subscriber

IN MOVING about our community after the Open House, many were the compliments that I received from persons that had attended or who had heard about it and were sorry that they had missed it. There was one letter from a subscriber that I believe summarized the reaction of many people coming to our Open House. I

The Commercial Department at the Sunland Company made use of signs and posters at its recent Open House celebration. At right is closed circuit television which delighted all the visitors.

AIRLINES use ELECTRONIC SECRETARY sets for speeding reservations—reconfirming—handling peak business.

DEPARTMENT STORES use the ELECTRONIC SECRETARY set to take orders—offer shop-by-phone service.

PACKING PLANTS use batteries of ELECTRONIC SECRETARY sets to take salesmen's orders—speed daily deliveries.

BIG business and SMALL business.

with ELECTRONIC SECRETARY® *telephone*

One-man shops or thousand-man organizations—they're all prospects for the revolutionary new ELECTRONIC SECRETARY® automatic phone answering sets.

With it, small firms now get the calls they used to miss when the phone went unattended – now profit from business that used to go to the next name in the Yellow Pages. And some of the biggest "name" companies in America use multiple ELECTRONIC SECRETARY sets to man order-taking departments, make announcements, cut clerical costs.

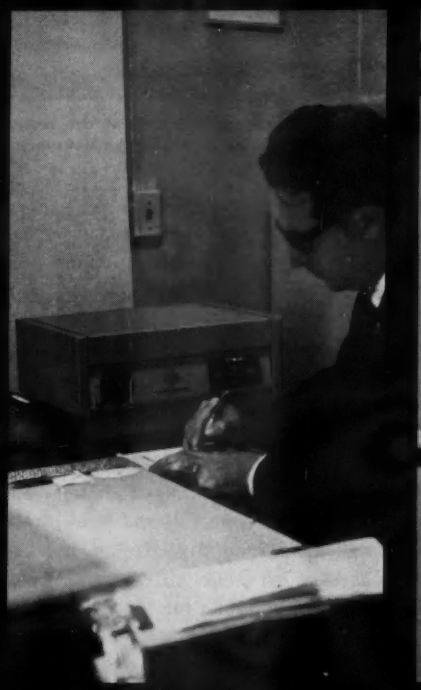
In any case, you'll find just the right ELECTRONIC SECRETARY set to meet any customer need: an AO (Answer Only) model for giving prerecorded messages – an SP (Short Play) model that both answers calls and takes up to twelve 13-second messages – an LP (Long Play) model that virtually "does everything."

So, as you can see, almost every commercial customer in your area can profitably rent an ELECTRONIC SECRETARY set – now featured in national advertising. To start cashing in on this big, new unrestricted profit opportunity, call or write one of the distributors listed at the right.

RADIO STATIONS use ELECTRONIC SECRETARY sets to inform callers of special broadcasts. Also after hours, to instruct callers that station is closed till morning.

REALTORS use an ELECTRONIC SECRETARY set to take calls while they're out showing homes.

DOCTORS and DENTISTS use an ELECTRONIC SECRETARY set to avoid interruption while with patients—give an emergency number after hours.



nean MORE business

nswering sets

Electronic Secretary Industries, Inc., Subsidiary of **GENERAL TELEPHONE & ELECTRONICS**

Distributed by

AUTOMATIC ELECTRIC SALES CORPORATION
400 North Wolf Road Northlake, Illinois

LEICH SALES CORPORATION
427 West Randolph St. Chicago 6, Illinois

cherished that letter and here it is:

Mrs. Herzfeld and myself have been remiss in thanking you for the courtesies shown by your company and your charming hostesses last Thursday at your Open House party.

Do accept our sincerest appreciation for the time well spent in learning all about the workings of your system.

I am certain that all who attended now have a better understanding of the many ramifications of your system and how little we pay for the wonderful service that you render. In no country in the world, I am certain, have the people such efficient service as we do here in these United States of America.

Today it is almost an impossibility to live a normal life without a telephone — in business, social, emergency or disaster a telephone is as necessary as food or shelter.

Once again, many thanks for an hour well spent.

Most cordially yours,
Selwyn A. Herzfeld

In our community there is also a blind man who makes his living as a capable piano tuner. In calling my home about a piano tuning job a few days after the Open House, he told me that he, too, had visited our Open House and now felt that he would never again be able to argue with the charges on his telephone bill after having been exposed to a lecture which described the machinery used to produce the bill.

Well, let's take a look at an outline for holding an Open House and consider the many things that might be involved. This outline is not intended to be complete but merely to be a springboard for your thinking of things to consider in giving your own Open House program.

Dates Of Open House

OPEN HOUSE programs should run two or three days in order that word of mouth publicity may gain momentum within the community and bring more visitors. This year we had ours as follows: Wednesday evening from 7 to 9 p.m.; Thursday from 2 to 9 p.m.; Friday from 2 to 9 p.m.; and Saturday from 10 a.m. to 4 p.m.

Wednesday evening was solely for employes and their immediate families. On this occasion we gave a buffet type meal and spent the entire two hours in enjoying the food, learning to know each other's families better, looking at the exhibits and visiting the various departments of the company.

The signs on the front and side of the telephone office attracted visitors to the Sunland Company's 50th Anniversary and Open House celebration.

On Thursday morning and Friday morning we invited a few special tours of youngsters from the school system but actually commenced opening the doors to the public at 2 p.m. each afternoon. We began at 2 p.m. each day in order that the regular work loads of each of the departments involved could be partially accomplished in the mornings. We terminated at 9 p.m. in order to permit the employes doing the lecturing and guiding to go home soon after 10 p.m. It took at least an hour after closing the doors to the public for those visitors who had already started the tour to finish and leave the premises.

We held the Open House on Saturday from 10 a.m. to 4 p.m. and did not go into the evening hours in order to avoid long working hours and overtime for employes. We found that some members of the public came down on Sunday and tried to get into the Open House which had been concluded the day before. In your own planning you might want to allow for being open on Sunday and it might even be a good idea to have it Friday, Saturday and Sunday rather than Thursday, Friday and Saturday as we did. However, there is a drawback to holding it on Sunday. If your employes go all out and participate as they did for us, you will find that they are virtually exhausted by the end of the three days and therefore it is wise to have a day off, such as Sunday, before they come back to regular duty.

Let's move on to considerations of the equipment to be displayed by departments.

Equipment And Services For Open-House Display

MANY of our companies do not necessarily have all phases of our service on one premise where it is possible to display them to the public. It appears advisable to me to display as many of the following as you possibly can.

In the commercial department we

The Traffic Department was a special point of interest to Open House visitors. The Sunland Company recently converted to mark sense ticketing in preparation for Direct Distance Dialing early in 1961. The company also plans to take over its own long distance toll operation during 1961. At present the operators handle only assistance traffic.

should show the handling of applications and service orders.

In the traffic department we should show the operation of the switchboards for toll purposes and for information service.

In the test and assignment center we should certainly discuss the test desk and how it helps the servicemen locate subscriber troubles. We should talk about trouble tickets and how they are processed and we should demonstrate assignment methods.

In central office switchrooms we should show and describe the functions of the main frame, the intermediate distributing frame, the selectors and connectors, long distance dialing equipment if available and toll ticketing equipment if available.

In the general and revenue accounting department we should display the machines used to prepare the monthly billing and give a careful description of the processing.

In the area of outside plant we should show maintenance vehicles and their tools, installation vehicles and tools and construction and cable splicing equipment.

In the marketing area we should display types of miscellaneous equipment available to the public and show off to best advantage every item of service that we have including radio telephone and prewiring of houses before installation of service.

We should display general office quarters of such departments as engineering and executive.

Signs

THROUGHOUT all departments there should be signs.

We want to identify each department's equipments in such a way that the public is not trying to learn a new language but can easily understand what the piece of machinery will do for him. For example, it probably would not be wise to label a frame as an "IDF Frame." If it is to be understood by the customer, we call it something similar to a "telephone number distributing frame."

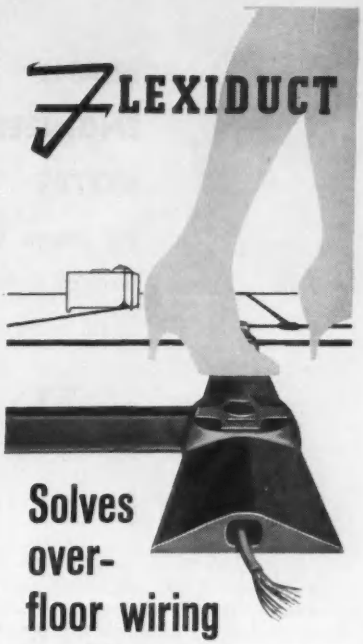
Signs will need to be prepared for advance publicity and should include bulletins and posters to be displayed around the community and banners and stickers to be used on vehicles.

Large signs on the company premises will be helpful in giving information to the public about the company. For example, a sign illustrating the number of employes, stations or dollars invested gives Mr. John Q. Public a better idea of what the company represents.

I can see that we're running out of column space and this is only the beginning of talking about Open House. I shall carry on in the 3/15 issue with a discussion of such things as publicity, invitations, routing of visitors and the many other items involved in Open House. See you then. — *Allan R. Stacey.*

The display of an installer's truck including an enlarged copy of the service order used by the installer was of great interest to visitors at Sunland Company's Open House. The large placard on the side of the truck is a permanent fixture on all the company trucks and is for the purpose of promoting telephone sales in the community.

FLEXIDUCT



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PLANT ENGINEERING NOTES

By JOHN S. REED
Technical Editor, TELEPHONE ENGINEER & MANAGEMENT

The "No-Break" Generator Principle

NEW STANDBY EQUIPMENT

No-Break generating set is designed for applications where the slightest power interruption may result in equipment damage or service interruption. The generator automatically takes over the load before the power supply voltage or frequency drops below acceptable limits.

RELIABILITY of communications is subject to the dependability of the power supply for central office and associated transmission equipment. If commercial power supply could be absolutely relied upon, there would be no need for an auxiliary or standby power supply.

As it is, however, commercial power systems are prone to interruptions even in large cities. As an example of this, not long ago, the failure of several important feeders caused a serious power interruption in New York City, creating great confusion and disrupting vital services. In this case, no interruption to telephone service in the area affected occurred because of standby generators which took over the load and enabled regular communications to be maintained during the emergency.

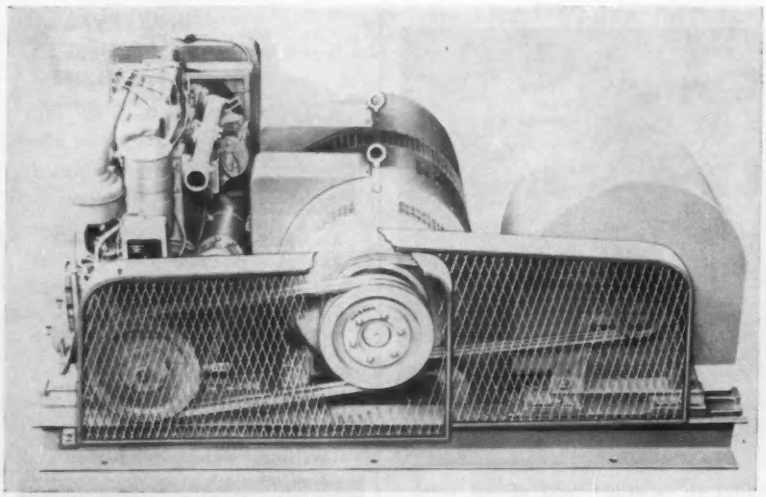

FIG. ONE: — Cut-away of a No-Break Generator Set showing the placement of the diesel engine, generator and flywheel. Note that these components are interconnected with V-belts which means easy serviceability of this unit and no re-alignment problems. (R. H. Sheppard Co.)

Telephone companies have generally been aware of the importance of standby equipment to maintain communication services during failures of commercial power. Ordinary standby generators are operated by gasoline or diesel engines. In changing from the commercial to auxiliary power, there is a short interruption because of the engine cranking or starting period and the power cannot be supplied until the engine attains its running speed. During that time, the building lights and house equipment are out, and only the telephone equipment connected to the central office battery can operate.

This momentary interruption of power is a serious matter in the case of microwave equipment since the central office battery is not used to operate this equipment. Also, standby motor generators are now used to furnish power to the entire telephone exchange including light and power requirements for the telephone equip-

ment building. For these reasons, the auxiliary equipment must be designed to operate immediately upon the interruption of the commercial power.

The solution is to operate the exchange load continuously from a generator which is run by an electric motor supplied from the commercial power mains and connected to generator and engine with all three running continuously together. When power to the motor is interrupted, a fly wheel keeps the generator shaft rotating while relays and a clutch cut in to start the engine. When the engine starts, it picks up the load and maintains the rotation of the generator shaft until commercial power cuts in again.

The Sheppard No-Break generating set illustrated in *Figure One* is designed especially for applications in the electronic and communication fields where the slightest power interruption may result in damage to costly equipment or interruption of vital services. This type of generator automatically takes over the load before the power supply voltage or frequency drops below acceptable limits and there is no discernible break in the continuity of the power supply.

The generating set consists of a diesel engine, a synchronous generator or motor generator and a fly wheel, all mounted on a common I-beam base. The three components are inter-connected with V-belts.

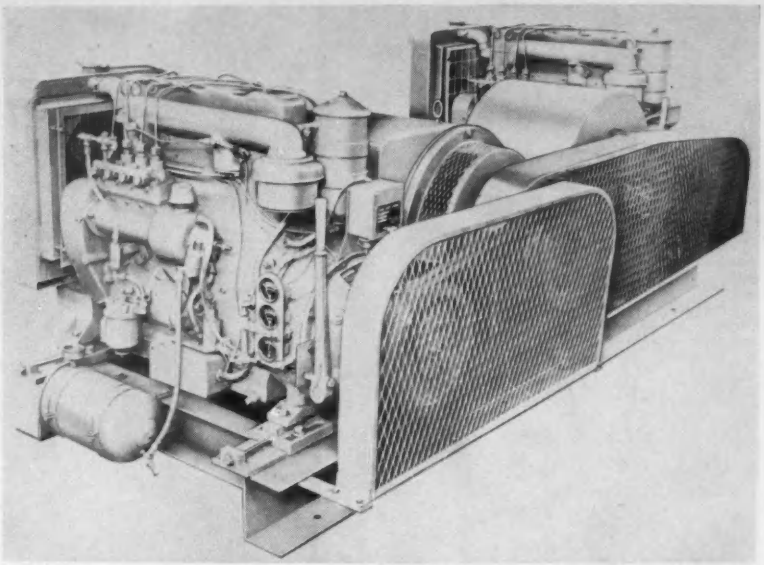

FIG. TWO: — The need for a Dual-No-Break Generating Set for remote areas has existed with the communications industry for some time. With the knowledge gained from the NOVACAP installations, the R. H. Sheppard Co. has been able to develop what it believes is the first such set for practical application.

With city power applied, the motor-generator or synchronous generator drives the fly wheel through the V-belt drive. When power failure occurs, the city line is automatically disconnected and the engine is started either by the electrical starting or inertia starting method.

In the first method, the engine is started by its own electrical system, not by the energy of the fly wheel. In the meantime, the fly wheel is driving the generator to supply power to the load. As the engine speed matches the generator speed, diesel power is applied to the generator through an overriding clutch and a V-belt drive, continuing to supply power as long as needed.

In inertia starting, the engine is started by the energy transmitted to the magnetic clutch mounted on the engine crankshaft. A small fly wheel mounted on the clutch shaft transmits immediate torque to the engine with the clutch is activated, starting the engine to provide power as long as needed.

After the city power returns to the lower limit of frequency and voltage for a pre-determined time, the engine is automatically stopped and commercial power is restored to the load.

The use of V-belts to inter-connect the three components of the generator set is primarily to provide a compact mounting for the components which would not be practical if the components were mounted on a common shaft with the fly wheel. The V-belts are designed for long life and easy serviceability of the unit. The long life feature is obtained by overbelting the units 300 per cent, that is, more than 300 percent power is obtained from the belts than actually

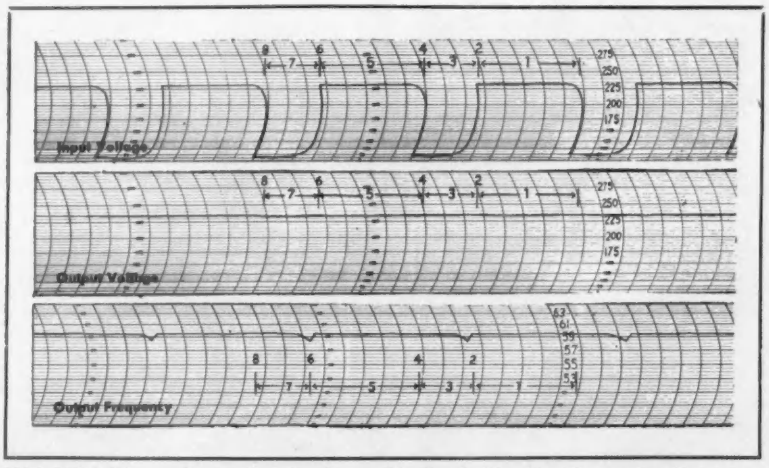

FIG. THREE: — Charts showing how a No-Break Standby Generating Set operates during a power failure: (1) Outside power available; motor driven operation; (2) total failure of outside power; (3) Sheppard Diesel driven operation; (4) Outside power restored; (5) Outside power available, motor driven operation; (6) total failure of outside power; (7) Sheppard Diesel driven operation; (8) outside power restored. (Chart speed — 9.6 seconds per inch.)

the ST

ARLITE* telephone

There's a great new look in telephones...and Starlite is it. This unique compact phone by AE offers you all of these important features:

Dial light shines years longer. Only Starlite has electroluminescent light...the lighting of the future. No bulb to burn out and replace every few months. And the dial light can be turned from soft to bright, or completely off, *any time*. Your subscriber can choose just the amount of light he wants.

Original design. It's smartly rectangular and less than half the size of a regular phone. Six sparkling colors: white, ivory, beige, pink, blue, turquoise.

Holds its place in use. Only Starlite has a rubberized cork pad covering the base. Starlite holds its place when user dials. New soft-pull handset cord.

UL Listed. Starlite meets all the requirements of Underwriters' Laboratories. It's your assurance of Starlite's complete reliability.

Main station or ringing extension. Starlite can be either one with our new miniature ringer box. It's only 5¼" x 5¼" x 2⅛" deep. Available in all six Starlite colors.

Starlite is the phone that will put extensions in more homes. It's the phone that will put more $$$'s in your revenue. Easy to order. Just write: Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., Toronto 16.

ASK FOR YOUR FREE STARLITE SALES KIT

Promote the Starlite in your area with the help of this big Sales Kit. Contains newspaper ad mat, envelope stuffer, display posters, commercials, publicity release and mat, display ideas, promotion guide. Write for your free copy.

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used, resulting in a minimum life expectancy of 25,000 hours for these belts.

The V-belt design is said to be superior to mounting of three components on a common shaft, for several reasons: —

(1) A standard electric motor generator can be used. This is a two-bearing, drip-proof unit with no special end bells, special fittings, or special bearings. The electric motor generator is mounted between the fly wheel and the engine.

(2) The fly wheel is mounted on its own bearing pillow blocks not dependent on either generator or the engine for support. Under this fly wheel are located belt tightening rails. The engine located on the opposite end of the mounting rails is a standard unit with a power takeoff clutch.

(3) Each component may be removed or may be serviced in place without removing or disturbing the other components. Each component can be individually removed and replaced without re-alignment problems. It is not necessary to have an exact alignment between each of the components on the mounting.

Diesel power is preferred to gasoline power for any power application requiring continuous operation. With a diesel engine, there is no carburetor or electrical ignition system which are major sources of trouble to gasoline engines in standby service. When a gasoline engine is employed, gasoline will evaporate while standing any length of time, leaving a gummy residue which clogs carburetors and fouls plugs. Another fault is the shorting out of plugs by damp weather and humid conditions. The effect is that the gasoline engine will not start when suddenly called upon in an emergency. The diesel engine is not subject to this condition and always can be depended upon to start immediately when needed.

No special housing is required for using diesel fuel because diesel fuel is non-explosive, and the generator can be housed in the main structure. Savings can be obtained by the elimination of the special building required by law for gasoline or LPG powered engines.

The no-break generator set requires automatic controls for proper operation of the equipment. Fully automatic control panels are used with a generating system and they are designed to meet individual requirements and are an integral part of the system. These controls comprise an ingenious combination of electrical and mechanical linkage which makes it impossible for power from the prime source and the standby generator set to be applied to the circuit at the same time.

Recently, Sheppard no-break generator equipment was installed at microwave relay stations between Rio De Janeiro and Brasilia, the newly established capital of Brazil, under contract with Radio Corporation of America. The relay stations were established under the city building agency, Companhia Urbanizadora da Nova Capital do Brasil, commonly referred to as NOVACAP. Brasilia is the capital of the world's fifth largest country, located in a remote area in a central plateau state of Goias of Brazil.

Since the relay stations had to be self contained units in the wilds of the Brazilian jungles, it was necessary for them to have trustworthy sources of power for the microwave equipment. The diesel engines had to give unfailing service as long as they had an adequate fuel supply. By using a system of automatic controls and programming the dual-20KW generator sets used in the NOVACAP project at the connecting stations are kept running 24 hours a day by the engines.

An interesting new product has come from the NOVACAP experiences. For remote locations and other areas where high quality outside power is not available, but where a no-break operation is required, the dual no-break generating set was developed. Dual no-breaks provide full power and maintain 100% of normal power values at all times. As shown in *Figure Two*, these units consist of a diesel engine, a synchronous generator, a fly wheel and another diesel engine, all inter-connected with V-belts and mounted on a common I-beam base.

At Rio de Janeiro and Brasilia, which have a source of city power, each has a standby no-break generator set of the single engine type.

Performance Of The Generating Equipment

THE performance of no-break generating equipment is indicated in the charts in *Figure Three*. These charts were taken during a series of performance checks. When total failure of outside power occurs and the load is operating on 225 volts, 60 cycle current, the momentary changes in readings actually were zero voltage and a 2 cycle drop maximum during the changeover to diesel power. The power losses are so slight that even most precise equipment, such as data processing, will continue performing at the required efficiency.

USI Multi-frequency RINGERS

The USI Multi-frequency Ringer is designed to fit any "500" type telephone set that will accommodate a WE Type "C" ringer.

This ringer features a patented mechanical tuning system that is independent of the tapper and gongs.

USI Ringers have lower current requirements. You can reduce interference to adjacent circuits with USI Ringers and use more ringers on a given line.

The extra high impedance of USI Multi-frequency Ringers reduces voice frequency loss.

USI CORP.

UNITED STATES INSTRUMENT CORPORATION

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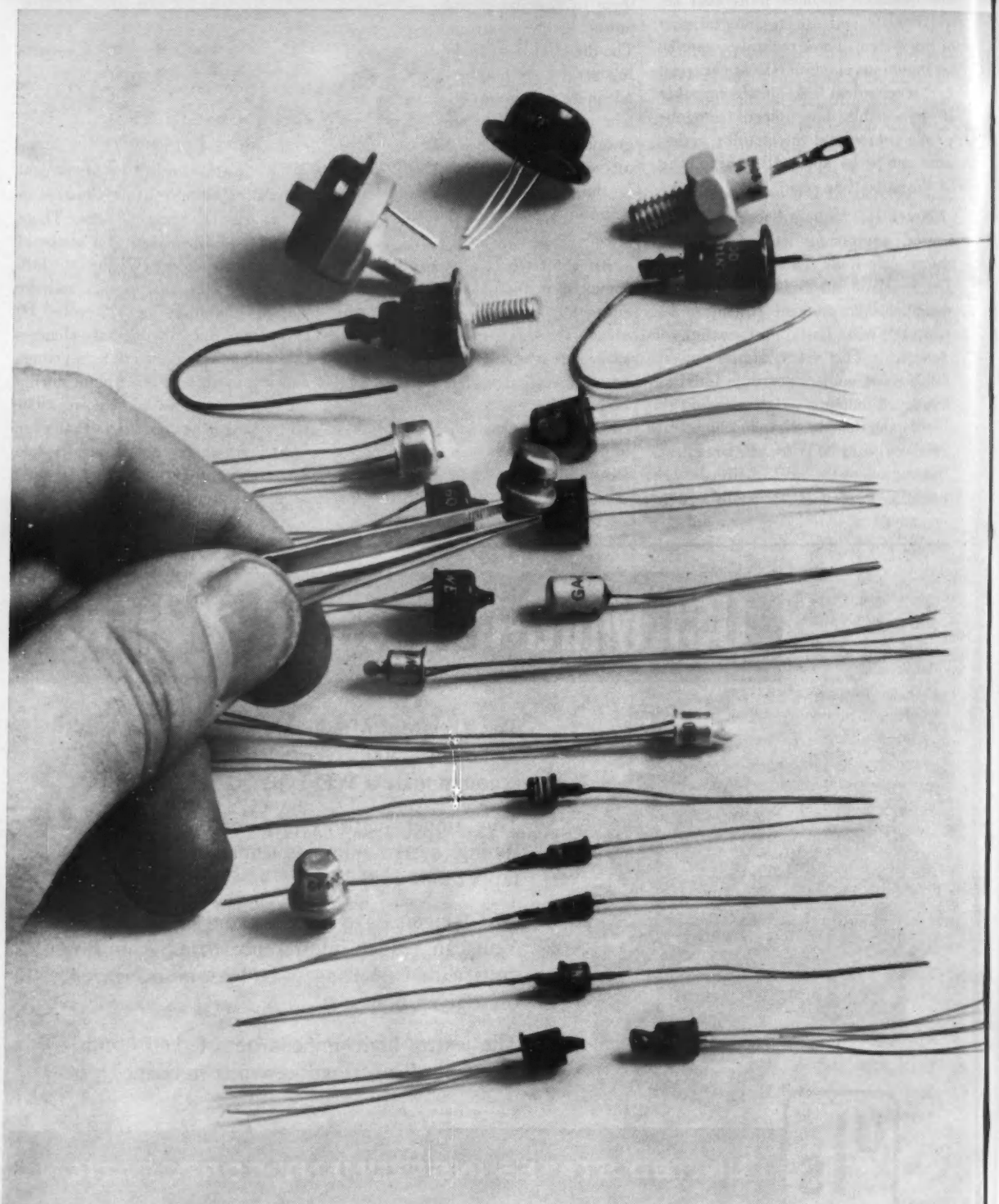
WESTERN ELECTRIC AND



MOSTLY MINIATURE are the electron devices produced by Western Electric's plant in Laureldale, Pennsylvania, for defense and space applications by the United States Government. Shown above are just a few of the transistors and diodes which are representative of more than 150 types of electronic products turned out at Laureldale by the millions every year.

LAURELDALE, PA.

Snugly situated on Marion and Vine Streets . . . against the wooded hills on the fringe of a charming Pennsylvania Dutch community . . . Western Electric's Laureldale Plant turns out millions of reliable transistors and other vital electronic products, principally for the U. S. Army.

The Western Electric Laureldale Plant is the nation's only manufacturing plant to be set up specifically at the request of the United States Government to devote facilities to high-quality semiconductor devices for national defense, space programs and other government uses.

This action taken in 1952 stemmed directly from these facts: the transistor was invented by Bell Telephone Laboratories, Western Electric's research teammate in the Bell System; and Western Electric pioneered the manufacture of transistors.

Today, the Laureldale Plant—with 2600 people on a $16 million payroll in 1960—produces annually more than $30 million worth of high-reliability transistors, diodes, and magnetrons. Berks County benefits from Western Electric purchases of more than $2 million in goods and services in the county each year.

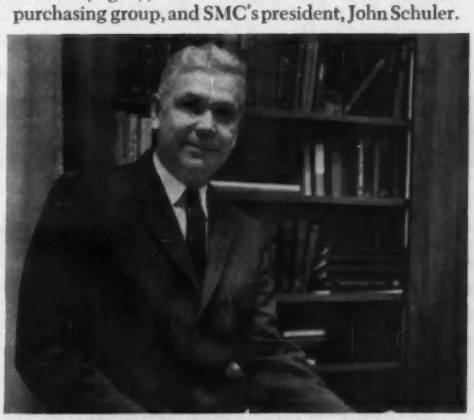
Western Electric is proud to be a good neighbor in Reading and Berks County, Pennsylvania. And we look forward to a bright future in Laureldale as we expand operations to meet the mounting demand for our "mighty miniatures" and magnetrons.

Besides Laureldale, Western Electric has 12 other principal manufacturing locations, where we make hundreds of different telephone products for the Bell System, and, in addition to these, a variety of products for the Government, mainly for defense. Last year we purchased over a billion dollars' worth of raw materials, products and services from our more than 35,000 suppliers located in every state of the Union. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers located in 33 cities.

Western Electric

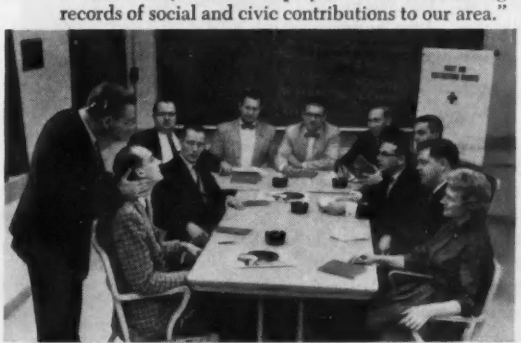
MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

INSPECTING a magnetron piece part produced in quantity for the Laureldale Plant by the Schuler Machine Corp. in nearby Reading, Pa., are John H. Peisert (right), of Western Electric's Laureldale purchasing group, and SMC's president, John Schuler.



PRAISE FROM PRESIDENT of the Greater Berks Development Fund, Sidney D. Kline: "Western Electric is supplying excellent industrial job opportunities here, and its employees have outstanding records of social and civic contributions to our area."

W.E. SCHOLARSHIP STUDENT, William W. Stewart, is greeted on campus by Albright College (Reading, Pa.) President, Dr. Harry V. Masters. In 1960 alone, Western Electric granted 167 individual scholarships to 118 colleges and universities throughout the country.



INSTRUCTING THE INSTRUCTORS in First Aid techniques at Laureldale Plant is Thomas J. Hlatky, demonstrating rescue breathing to fellow W.E. employees, who contribute time teaching Berks residents.

"Communication Links"

(Continued from page 52)

junction with the Tel-A-Scan or oscilloscope unit for "real time" analysis of the waveform actuating the receiver. Terminals are provided for the conjunctive use of these units in their portable configurations. In this mode, the Z-axis receiver output causes a bright dot to appear on the Tel-A-Scan trace at a point on the waveform where the receiver is being triggered. Simultaneously, distortion observations can be made by means of the receiver's CRT display.

The TDMS receiver is capable of detecting, measuring, and analyzing distortion without taking a telegraphic or data-system channel out of service. The receiver unit allows the operator to detect distortion, measure it, and determine its nature and probable cause, even when it is impossible to determine message-errors, such as when encrypted messages, or code groups, are being transmitted. (It should be noted that the fact that a teleprinter or other data-recording device is operating correctly does not mean degrading distortion is not present.)

Once the nature of the distortion is known, it is possible to correct the fault before a link becomes unserviceable. Distortion caused by a badly-tuned receiver in a radio link, for example, can be corrected without interrupting the flow of traffic.

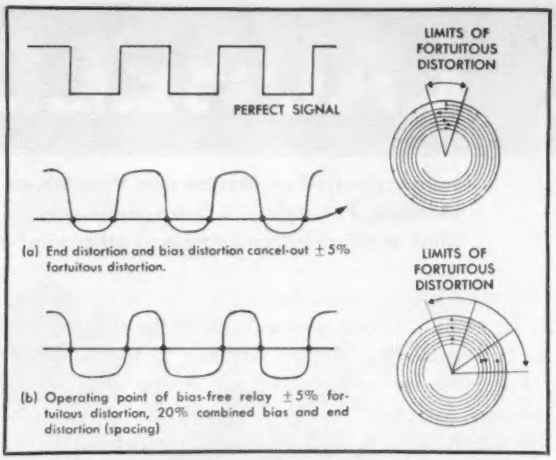

PERFECT SIGNAL
LIMITS OF FORTUITOUS DISTORTION
(a) End distortion and bias distortion cancel-out ±5% fortuitous distortion.
LIMITS OF FORTUITOUS DISTORTION
(b) Operating point of bias-free relay ±5% fortuitous distortion, 20% combined bias and end distortion (spacing)

FIGURE FOUR: — End, bias and fortuitous distortion (voltage waveforms). The first waveform shown is that of a perfect-character signal. The waveform in (a) applied to a TDMS receiver, with the line balance control adjusted to give a display centered about the zero distortion line, gives the limits of fortuitous distortion. In (b) the line balance control is adjusted so that the bright spots occur at the waveform's center; this is where a bias-free relay would operate. Here, the combined bias and end distortion produce the effect of 20 percent spacing bias. Actually, the signal illustrated has 30 percent spacing bias, but this is cancelled-out by the end distortion of the line.

Even in those instances where distortion is induced by causes beyond the control of diagnostic ability of a non-technical operator, he can tell when a circuit is

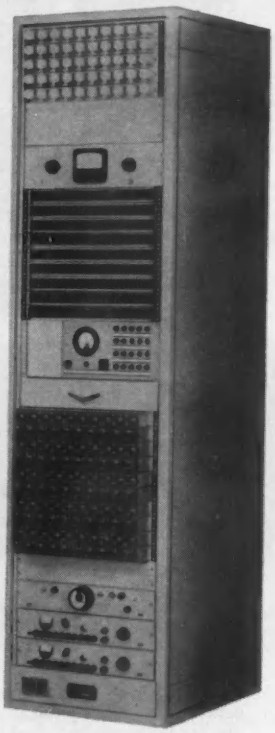
GET ON THE ALTEC LINE—for improved communication equipment

Copyright 1961 Altec Lansing Corporation

For performance, reliability, and servicing ease, the Altec line of amplifiers and equipment have won a resounding vote of confidence from the industry. Precision-engineered to meet your most exacting specifications, Altec products offer the improved design that makes maximum use of minimum space — and the "plus" that makes the difference — Altec quality.

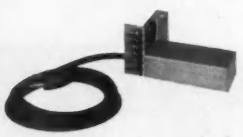
ALTEC "Quick-Fix Termination Bay

Typical cable termination bay has capacity for 50 transmitting and 50 receiving channels. Equipped with ALTEC plug-in line repeat coils, transistorized plug-in repeater amplifiers, plug-in equalizers.



The 455A Amplifier is a transistorized repeater type amplifier wrapping up a compact package of gain for telephone circuit use. Incorporates the gain, power handling capacity, frequency response, plug-in features in the physical size of vacuum tube type repeater. Ten repeaters go in the same standard rack mount used for vacuum tube types. Operates on 48 volt DC @ 22 ma: (453A model operates on 24 volt DC). Since it is transistorized no 130 volt supply is needed. For details, write for Altec Lansing Bulletin #AL-1600.

The 533 Power Supply is designed to fit within a 105-B Apparatus Box. The power supply bracket includes the required socket and space to mount a single ALTEC transistorized repeater type 449, 450 or 453-A and, at reduced power, the 447-A. Operating from 117 volts AC the unit delivers 20 v at 25 ma. Write for Bulletin #AL-1600.



The 12910 panel is provided to mount 10 amplifiers or Altec line Equalizers. The panel is 1¾" in height.

For complete information about Altec telephone and paging equipment, write to the address below or call 714- PRospect 4-2900 in Anaheim.

ALTEC LANSING CORPORATION

ALTEC LANSING CORPORATION, DEPT. TE-2
1515 S. Manchester Ave., Anaheim, Calif.
161 6th Ave., New York 13, N. Y.
A subsidiary of Ling-Temco Electronics, Inc.

deteriorating and how seriously. This allows the operator to intelligently determine when distortion is exceeding the margin acceptable to a specific receiving terminal. Even a lay-operator totally unfamiliar with oscilloscopic waveform analysis will, with little preliminary briefing, be able to use the receiver in detecting, measuring, and determining the nature of signal distortion.

Since the TDMS receiver enables an observer to detect and analyze distortion, and thereby diagnose a probable cause of garbling and false printing, it is possible to maintain circuits in operation for prolonged periods with only brief breaks for maintenance. Finally, preventive measures often may be taken during normal intervals in traffic so that the line is, in effect, never taken out of service.

Particularly where a telegraph or data-system station represents but one link in a complex chain of connections, the distortion in that link should be held to a minimum. Further distortion must inevitably occur in succeeding links, and the effects may be cumulative. Correct analyses of distortion in a system also can give a very great deal of information in the event of a fault occurring.

The types of distortion which can be detected and analyzed by the TDMS receiver, plus a few of the causes which might cause such distortion, are listed below.

Bias distortion involves the uniform lengthening or shortening of the space elements at the expense of the mark elements. Where the spacing signal is lengthened, the system is said to have *spacing bias;* where it is shortened there is *marking bias.* The result is that the total time of one mark and one space is constant. This type of distortion usually is caused by maladjustment of some part of the system, such as an improperly adjusted relay or an inaccurately tuned receiver in a frequency shift system.

End distortion often is mistaken for bias distortion. It rises, however, from entirely different causes. It consists of a uniform displacement of mark sense transitions. Space-mark transitions remain unaffected.

Fortuitous distortion is a purely random displacement of signal transitions. It is caused by line pickup, noise, dirty contacts, a-c induction from power supplies and similar sources.

Characteristic distortion is a repetitive consistent distortion of one-or-more signal elements. If, for example, the fourth signal-element were invariably split, this would be termed characteristic distortion.

Tel-A-Scan Unit of TDMS

THE Tel-A-Scan unit is a versatile oscilloscope designed for special use in standard telegraph, data and communications system. It allows direct visual analyses of signal waveforms presented by a linear (A-Scan) CRT trace. This unit is capable of measuring the voltage of the incoming signal, with five percent accuracy, without interfering with the waveform presentation. In addition to its TDMS functional applications, the unit can serve as a general-purpose test oscilloscope for a variety of maintenance and trouble shooting applications.

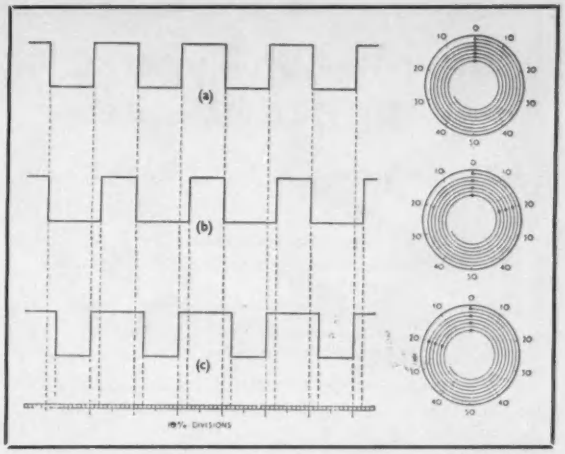


FIGURE FIVE: — Bias distortion and the corresponding displays on a TDMS receiver: (a) A-c reversals and zero bias producing perfect signals, (b) 20 percent spacing bias is caused by delay of the space-mark changeovers. The mark-space changeovers remain as in the perfect signal. (c) The 20 percent marking bias is caused by delay of the markspace changeovers. The space-mark changeovers remain as in the perfect signal.

The oscilloscope unit has eight input terminals, any one of which may be selected at will by means of a switch located on the front panel. Five of the input terminals are located on the rear panel, and three others are situated on the front panel. The five input terminals on the rear panel are differently connected into a vertical amplifier. Two of the input terminals on the front panel, when connected separately, provide one side grounded; when both terminals are utilized, a differential input is provided. The input impedance of all lines is at least one megohm. The vertical amplifier is flat from dc through 7 megacycles allowing a rise-time display of better than 0.2 microseconds.

The equipment is designed to enable the operator to select any vertical point on the waveform at will, and to accurately measure the signal voltage at the specific point. This is accomplished without interfering with the waveform presentation and without interrupting traffic. A selector switch allows a choice of internal external and 60-cycle positive or negative synchronization.

A modified phantastron circuit provides triggered sweeps linear to one percent in 10 ranges from 30 microseconds. The "Sweep Magnifier" provides a sweep-magnification which enlarges the waveform eightfold and permits visual observation of the time base at any segment on the CRT graticule.

The oscilloscope can be used to monitor the output of the transmitter unit, and analyze the waveform of the signal actuating the transmitter in its receiving mode. By means of the intensity-modulation (Z-axis) feature, the unit is capable of indicating the exact point on the wave form of an incoming signal that is being sampled by the TDMS receiver and thus efficiently analyze the nature of this distortion. — *John S. Reed.*

New ¾-ton Type "C" Pull-A-Way

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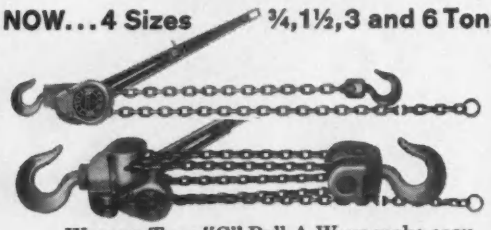

WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6-ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 12½ lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

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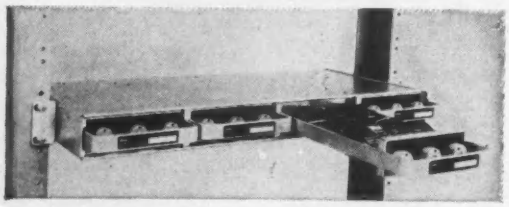

The Type 251A Voice Frequency Repeater is designed for use on wire lines to amplify voice frequency signals. Its two transistor amplifiers provide up to 20 db gain in each direction. It draws only 3.4 milliamps from a 12, 24 or 48 volt battery. Four of these compact repeaters fit on one mounting shelf. Easiest to adjust . . . no test equipment required.

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"Regulation & The Investor"

(Continued from page 50)

more or less abundant in the future. Experts on this subject offer little reassurance.

Dr. Yale Brozen, professor of economics at the University of Chicago, has pointed out that our stock of capital is growing less rapidly than it did in the 1920's.

And Peter F. Drucker of the New York University Business School flatly forecasts capital shortages during the next decade. He feels these shortages will stem from sharp growth in population, demand for community services, and the accumulated replacement needs of industry.

This, he says, "will increasingly require that companies develop a distinct and marketable financial 'product' of their own, which will enable them to offer the financial satisfactions that fit the needs, wants and expectations of the increasingly sophisticated, increasingly professional customers in the capital market — the professional trustees for other people's money."

It seems clear that as our society provides people with more and more protection against financial disaster, the incentive to save is reduced. After all, why save for a rainy day if it is not going to rain any more. And as savings go down, or fail to rise, so does the supply of new capital. In time the point is reached where the people want to borrow more than they are prepared to save.

All this adds up to three simple facts. First, we may question the future popularity of utility securities with the investor. Second, the future need of utilities for investment money will be high. And third, there is a likelihood of keen competition for capital — perhaps even some capital shortages — in the future.

These facts leave no room for complacency in viewing the future of our utilities. It seems obvious that the key to success in this matter lies in proper utility earnings levels. These levels must compare reasonably with those of other companies which compete for the favor of the investor.

The responsibility for utility earnings rests jointly upon the manager and the regulator.

I should like to emphasize the portion of this responsibility which belongs to the manager. Occasionally I hear people talk about the poor earnings or the good earnings of a utility as though the responsibility were entirely that of the commission. These people seem to think that a commission can set a rate of return at a given level, and that is what the utility will earn until the commission changes it. Nothing could be farther from the truth. I suggest that any person who believes this try to find a year in which a utility earns exactly what the commission specified in its last rate order.

Certainly commissions regulate earnings. But so does the efficiency level at which the utility operates. So do employe attitudes and work habits. So do changes in technology. When a company comes before a commission to seek a rate increase, the regulator may properly inquire into these things.

The manager who has carried out his full responsibility for utility earnings can answer these questions affirmatively. After he has done so, and only then, does the regulator's responsibility for utility earnings come into play.

This responsibility, however, is fully as important as that of the manager, for cases which come to the regulator for decision generally include the distress situations, where serious questions are raised as to the future capacity of the utility to provide service.

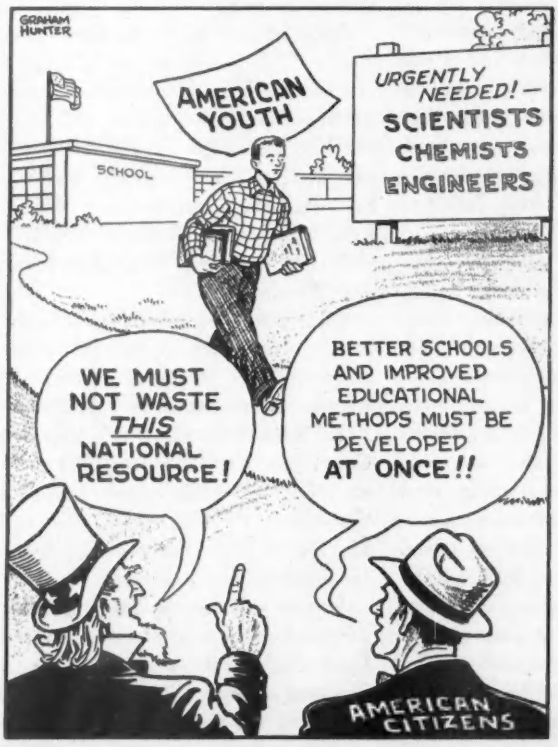
In such cases, it is the responsibility of the regulator to assure himself that enough rate relief is provided so the utility has both incentive and ability to provide the best in service.

Utility rates can be depressed so far as to hurt the public interest in a far more serious sense than fair and reasonable, or even generous rates — although I do not advocate the latter. Naturally the consumer likes the lowest possible rate. The question is, can he afford it?

Actually, inflation has obscured some of the great accomplishments of regulation. The fact that utility rates have risen less than other consumer prices is clear evidence of these accomplishments. This amounts to the same thing as reducing the price in a stable economy. Coupled with continued improvements in service, the record is one in which regulators and managers may take pride.

Let us hope we can continue to achieve such successful results. — *To be continued. . . .* (*Editor's Note. Let us know if you want reprints of Mr. Brown's series on "Regulation." If demand is heavy, we may reprint the series as a booklet.*)

NO TIME TO LOSE!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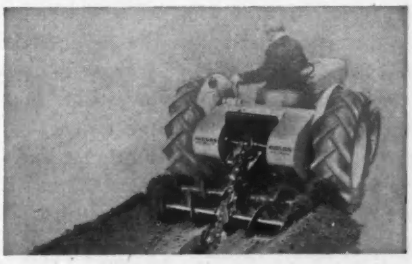

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NEWS REPORT

Telephone Industry News Highlights

COAST-TO-COAST REPORTS

- News releases from nation's telephone companies indicate telephone industry's 1961 expansion-improvement program may set record.
- U.S.I.T.A. President Pearce warns Florida convention "Telephone industry must double efforts to meet competition."
- $106,900,000 In Telephone Loans approved by REA in 1960 . . . Favorable outlook for telephone industry seen by BDSA.

Nation's Telephone Companies Plan Record High Expansion Improvement Programs For 1961

WHATEVER the telephone industry's other challenges may be in 1961, the nation's telephone companies will have a busy construction year. In fact, news releases announcing planned expansion-improvement programs indicate the telephone industry's 1961 construction expenditures may well be the highest yet.

In Lincoln, Neb. the Lincoln Tel. & Tel. Co. reported a $6,500,000 construction program is planned for growth and improvement in its 22-county area. At year-end, Lincoln Tel. operated 126 exchanges and served 146,608 telephones. In 1961 it will: (1) convert the York exchange to dial and provide direct distance dialing facilities for York and Polk counties; (2) install dial equipment in 15 other exchanges; (3) install direct distance dialing facilities at Ashland, Milford, Valparaiso, Ceresco, Elmwood, Adams, Clatonia, Wilber, and Panama; (4) At Lincoln, 10 new toll switchboards, eight information boards and two toll testing switchboards will be installed, additional direct distance dialing equipment will be installed and more local dialing equipment added, and a microwave radio system will be installed to provide long distance service between Lincoln, Hebron, Geneva and Fairbury; and (5) switchboard additions will be made at Crete, Hastings and Seward.

In Illinois General Telephone Co. of Ill., will spend an estimated $18½ million on construction during 1961. The new construction program is the largest in the company's history.

Outside plant improvements account for the largest portion of the budget, $5,034,000. Funds set aside for central office equipment total $5,055,000. Carrier and toll terminating equipment will take the third largest slice of the sum, $2,600,000.

Land and buildings will cost $1,640,000. Station apparatus will account for $1,403,000, and installations of PBX's and PABX's will take $1,155,000. Station connections will cost $1,000,000. The remainder of the $18½ million outlay will be spent on motor vehicles, tools, furniture and fixtures.

The 1961 program includes the sums necessary to reduce all rural line loads to 10 parties or less by the end of the year.

Some of the major projects this year will be the conversion of 12 exchanges to dial and the replacement of five dial central offices that are reaching their capacity. Exchanges to be converted are Alexander, Anchor, Carlock, Chatsworth, Cropsey, Mahomet, Manchester, Monmouth, Teutopolis, Washington, West Brooklyn and Woodson.

Dial offices to be replaced with larger offices are in the following communities: Argenta, LaMoille, Pontiac, Shawneetown and Rockport.

In Wisconsin General Telephone Co. of Wisc. announced its 1961 construction budget "has reached an all-time high of $10,132,000 — up $1,197,700 from the previous high set in 1960."

Money will be provided for the construction of two new division offices with warehousing and garage facilities to begin this year.

One of the major expenditures is

represented by the $591,900 to be used in 1961 for gross additions to automotive equipment. This program will include the purchase of construction vehicles to complete the changeover from large to small crews.

According to a report on the budget, issued by the Operating Vice President, W. C. Rowland, the budget has been planned to meet predicted subscriber demand as well as the reduction of many held applications for new service and regrades. Also included in the plans, according to the report, are facilities to extend rural lines and reduce subscriber totals on some 355 overloaded lines.

In addition to the establishment of the Jacksonport exchange on a dial basis, four other dial conversions and four replacements are planned. Approximately 5,752 telephones will be affected by the changes.

Exchanges scheduled for conversion in '61 are: Melrose, Rosendale, Hubertus and Tomahawk. Dial replacements will take place at Witwen, Greenbush, Marytown and Cottage Grove.

In Kentucky General Telephone of Ky., President F. C. Rahdert announced the company has invested more than $23,000,000 in new plant during the past three years as part of an expansion and improvement program amounting to more than $31,000,000. During 1961, emphasis is being directed toward completing this program and meeting the continuing demand for more and better service.

Dial conversions planned for the Albany, Burkesville, Lancaster and Leitchfield exchanges, will complete the company's dial conversion program and provide 100% dial operated service in every Gen. Tel. of Kentucky exchange.

In the company's Central Division, one of the highlights will be the introduction of customer Direct Distance Dialing for the Berea and Lancaster exchanges.

The Bryantsville exchange will be provided with an equipment addition prior to the Lancaster conversion for enlarged customer services. In the Hazard District the Hyden, Stinnett and Wooton toll line will be rehabilitated. Additional rural lines and rearrangements of cable facilities are scheduled to enlarge the service capacities of the district.

Plans for Lexington telephone service include many cable construction and equipment addition projects to provide a high grade of service to subdivisions and other urban areas to fill customer requests and anticipated demands as the community continued to grow. Equipment for central offices and services for businesses in Lexington include mobile telephone service.

A variety of projects in the Eastern Division include pressurizing of cables in the Catlettsburg and Russell exchanges to help in the prevention of service outages, replacing the Grayson office dial equipment with a larger system, and rural line extensions in Flemingsburg, Grayson and Morehead. Equipment will be added to the Olive Hill and Morehead exchanges.

Various businesses in Ashland will be provided with improved equipment and new Private Branch Exchange systems in 1961. Extended Area Service for the communities of Russell and Greenup will be established this year.

The communities of Leitchfield and Burkesville will be converted to dial operation in the Western Division and the Columbia exchange will be enlarged to handle future customer requirements. Primary or additional Extended Area Service for Leitchfield, Sonora and Tompkinsville are also in 1961 projects. Additional long distance facilities will be installed in the Elizabethtown and Glasgow offices.

The construction of urban cable projects and new equipment additions will add to the quality of service received in the Campbellsville, Greensburg and Loretto exchanges during 1961. The Albany exchange will be converted to dial operated service with new equipment and exchange building being constructed. Other projects in this area will be designed to enlarge the capacities of customer service from the exchange equipment to Somerset, Burnside and Monticello customers served by the company.

An estimated $90,000 will be required in the company's four divisions for anticipated costs involved in relocation of facilities due to highway construction.

Over seven million dollars was spent in 1960 for new plant, equipment and service improvements. Among the major projects in 1960 were the construction and equipping of the ten exchanges for conversion to dial operation.

At the end of 1960 the company had a total plant investment of $49,338,000 and served 132,437 telephones through 47 exchanges and 31 counties in Kentucky.

USITA President Warns That Industry "Must Double Efforts To Meet Competition"

THE President of the United States Independent Telephone Association, C. C. Pearce of Riceville, Iowa, in an address presented at the 53rd annual convention of the Florida Telephone Association, warned that the telephone industry is "faced with increased competition from other organizations selling communications."

"With all the competition and foreseeable changes plus the added population of the next 10 years," he said, "we must redouble our efforts to meet the needs of our present and future subscribers promptly, efficiently, and economically in cooperation with other Independent companies and the Bell System."

Looking to the future, the USITA president told the delegates attending the convention at the Hotel Robert Meyer, Jacksonville, "we must remain corporately healthy."

"We must see that our earnings are adequate to attract new capital," he said. "We must provide adequately for the replacement of worn-out equipment, and equipment that is becoming obsolete. We must take advantage of every advance in the com-

munication art. We must determine the needs and desires of our customers and provide them service to meet these needs."

Stressing the importance of the national and state telephone associations, President Pearce stated "we must work for and support our state and national associations and the committees which offer the best vehicles for cooperation and teamwork between the Independents, and between Independents and Bell.

"In this highly competitive and technical age, where being one step ahead means survival," Pearce said, "the Independent telephone companies must stay more than one step ahead by expanding operations, developing new equipment, offering new services, and by maintaining a position progressive enough to cope with the most progressive problems created by society and time."

Mitchell N. Drew, president of the Quincy (Fla.) Telephone Co., reported to the convention on his attendance at the 3rd annual "USITA Management Development Program" at the University of Kansas.

"The objectives of this particular school were to help the participating executives do more effective jobs in their current positions and to help them prepare for more challenging responsibilities," he stated.

Reporting that the class represented the various divisions found in any company, Drew stated that "*this* was the source of most of the benefits of the school."

"When telephone people get together," he said, "they talk, and talk we did, at Lawrence, Kansas last summer. We discussed ideas at great length on the subjects which we studied — but we discussed also those problems of our business about which we had no formal instruction. And it was *helpful* — as an exchange of ideas always is."

Florida Association President JOHN B. RENWICK (left) meets with Secretary JOSEPHINE POPPLETON, and 2nd Vice President E. D. WILKINSON during recent convention.

Emphasizing that "the *real* meat" in the school was the formal instruction received by the class, Drew pointed out that each course was taught by the case study method.

"A case," he said, "is a situation; facts are presented which give necessary or desired background to some problem which may or may not be clearly spelled out. Beneficial discussion in class required that the participants be fully familiar with the facts of the case. Therefore, the case and other readings on the area involved were read by the students in preparation the evening before the case was discussed in class."

Drew praised the USITA Personnel Committee for its decision to hold and sponsor schools of this and other types.

"Many, many telephone companies would not be able to provide their people with the necessary training to get a better job done if it were not

Officers and directors of the Florida Telephone Association: Back Row (l. to r.) J. N. JOHNSON, H. D. LEDBETTER, H. C. McFARLANE, M. N. DREW, R. W. SHRINER, F. S. McGEHEE, J. L. SHARIT, C. D. BROREIN, MAX WETTSTEIN, J. P. EVANS, D. T. SHEARER, and OTTO WETTSTEIN, III. Front Row (seated l. to r.): J. K. GALLOWAY, E. L. COX, E. D. WILKINSON, JOSEPHINE POPPLETON, J. B. RENWICK, E. M. MENENDEZ, W. E. QUATTLEBAUM, JR., and C. D. BROREIN JR.

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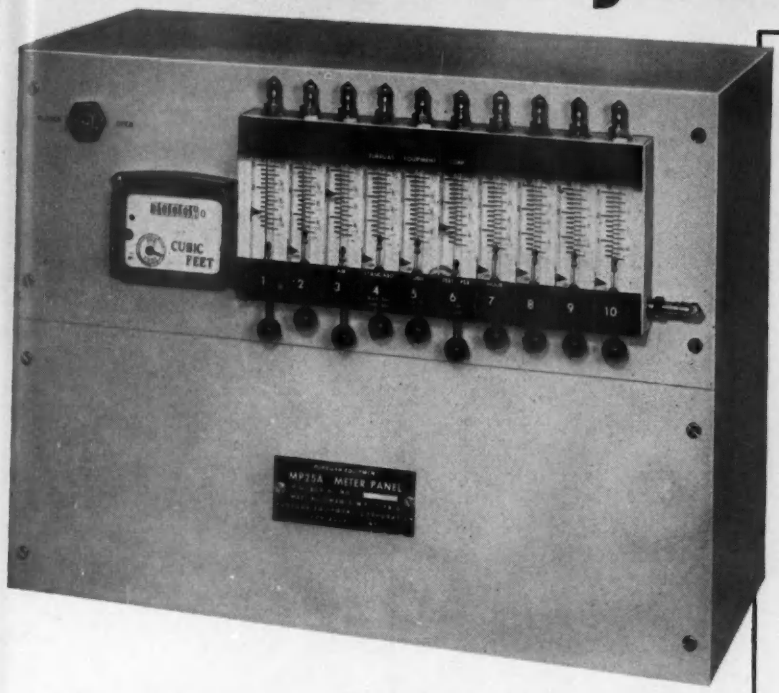

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Serious breaks along the line, however, cause excessive leakage of air, and are indicated on the PUREGAS Metering Panel.

Using GMP accessories, repairmen then pinpoint location of the breaks—by noting differences in air *pressure* at selected points—and make repairs, usually during normal working hours.

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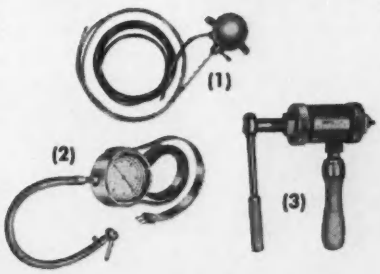

GMP Pressure Testing Contactors (1) located at strategic points, monitor pressure throughout the system and aid in detecting leaks. *Pressure Testing Gauges* (2) give precise measurements of pressure. *Pressure Guns* (3) inject compound into cable to make pressure plugs. These, as well as Pressure Testing Ells, Drills, Depressors, Sealing Compound and other tools for pressurized systems, are made by General Machine Products Company and are available via Graybar.

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for this concerted effort by our association," he said, "I can assure you that my classmates and I can testify to the long term value to each of our companies."

Florida Traffic Conference Speaker R. E. King, general traffic manager, Inter-County Telephone & Telegraph Corp., Ft. Myers, told his audience that "Automation's most important impact will not be on unemployment but on the qualifications and functions of employes."

"Large numbers of people will be required behind the scenes in new, highly skilled jobs," he said. "In addition, large numbers of highly educated people will be needed in new jobs. Large numbers will be needed for new managerial jobs requiring a high ability to think, to analyze, to make decisions, and to assume responsibilities. This increase, both in the numbers of managers, and in the demands made on them, may well be the largest of all the social impacts of automation."

Emphasizing that the industry must "act fast" if it expects to have good managers in the business tomorrow, King stated "Management must never aim at replacing what is today. It must always focus on the needs of tomorrow."

"Managers," he said, "do not become broader by adding one narrow specialty to another; they become broader by seeing the business as a whole. Management must focus on performance rather than on promise and on tomorrow's requirements rather than those of today. Developing tomorrow's managers means, in effect, developing today's employes — all of them — to be bigger men and better employes . . . Today's manager must be somewhat of a psychologist to get the job done. The days of directing people to do a job have long since fallen by the wayside. Americans can do anything if you tell them why, but you must tell them!"

Referring to "a lot of talk about the shortcomings of our young people," King said "We blame them for a lack of ambition and drive, for wanting security, for being afraid to stick their necks out and assume responsibility."

JOHN B. RENWICK (left), newly-elected president of the Florida Telephone Association, presents plaque to outgoing president E. M. MENENDEZ.

"Is it their fault or ours?", he asked. "We have taught them, both by precept and example, that getting along with people is the most important thing in the world. How can you train potential leaders by handling your candidates as if they were entrants in a perpetual popularity contest? I don't think you can! I don't think you can develop leaders in an atmosphere where individual achievement, the only source of real and lasting personal satisfaction, is sacrificed for the empty goal of becoming an unobtrusive member of some big happy family.

"That isn't the way you breed leadership — and leadership is what we need in every level of our organization, from top to bottom. There is no reason to make leadership easy, any more than tennis or football is easy. Like sports, leadership requires a certain amount of hard work and practice and, like sports, leadership can be both a challenge and a delight. We must teach our people to *think*, to analyze, and to act. And if they make mistakes, to get the most out of the experience."

F. L. Vanderwater, general traffic engineer, General Telephone Co. of Fla., Tampa, told the Traffic Conference that during the past several years, the routing of calls and the operation of toll circuits have been revolutionized.

"It has advanced to the point here in Florida that some of our newer operators hardly understand the true meaning of ringdown," he said. "Traffic engineers have been right in the middle of this revolution formulating plans for conversion to dial and toll centering in accordance with nationwide homing arrangements.

"Only last week, I heard that our company had just been billed $800,000 for carrier and microwave equipment for modernization and extensions of our toll network. This is getting to be big business . . . a vital one for growing Florida. It is the responsibility of the traffic engineers to forecast these toll circuit requirements."

Emphasizing that without traffic engineering to provide proper facilities, operators would be hard pressed to meet their objectives, Vanderwater stated that "Without the help of reports and studies supplied by operations, we engineers would also be unable to meet ours."

"I don't know of any phase of the telephone industry that has changed

as much as traffic operations," he said. "In a comparatively short time, they have taken in strides such changes as ringdown to dial, elimination of TX positions, mark sense, Direct Distance Dialing, Traffic engineering has kept in step with these changes in the past and we are fighting hard to keep abreast of new things. Just around the corner are such new ideas as wide area telephone service, data transmission, electronic switching equipment and equipment for customer dialing of person, collect and special types of calls. All of these new concepts in telephony . . . while we are still striving to upgrade our present service . . . keep us engineers on our toes."

Burton Brown, general traffic manager of the Florida Telephone Corp., presided at the Traffic Conference.

Stanley Warth, Florida transmission and protection engineer, Southern Bell Telephone & Telegraph Co., presided at the Commercial & Plant Conference. This conference featured addresses presented by Mr. Warth; R. B. Strang, plant supervisor, Southern Bell Telephone & Telegraph Co.; G. D. Boggs, exchange transmission engineer, Southern Bell.

Officers of the Florida Association are: President, John B. Renwick, General Telephone Co. of Fla., Tampa; 1st Vice President, B. A. Galloway, Winter Park Telephone Co., Winter Park; 2nd Vice President, E. D. Wilkinson, Southeastern Telephone Co., Tallahassee; Secretary-Treasurer, Josephine Poppleton, General Telephone Co. of Fla., Tampa.

Members of the Executive Committee are: John B. Renwick, chairman; Carl D. Brorein, Jr.; Mitchell N. Drew; John P. Evans; J. K. Galloway; J. N. Johnson; Fred S. McGehee; E. M. Menendez; and Max Wettstein. Ex Officio Committee members are. Hugh C. MacFarlane and Josephine Poppleton.

Members of the Board of Directors are: H. A. Bishop, Jr., Starke Telephone Co., Starke; Carl D. Brorein, Jr., General Telephone Co. of Fla., Tampa; E. L. Cox, Gulf Telephone Co., Perry; M. N. Drew, Quincy Telephone Co., Quincy; John P. Evans, Southern Bell Telephone & Telegraph Co., Jacksonville; B. A. Galloway, Winter Park Telephone Co., Winter Park; J. K. Galloway, Winter Park Telephone Co., Winter Park; J. N. Johnson, Inter-County Telephone & Telegraph Co., Fort Myers; Ralph Maner (Representing Manufacturers), L. M. Berry & Co., Tampa; Fred S. McGehee, West Florida Telephone Co., Marianna; E. M. Menendez, Southeastern Telephone Co., Tallahassee; Josephine Poppleton, General Telephone Co. of Fla., Tampa; W. E. Quattlebaum, Jr., Tri-County Telephone Co., Bonifay; John B. Renwick, General Telephone Co., of Fla., Tampa; J. L. Sharit, St. Joseph Telephone & Telegraph Co., Port St. Joe; D. T. Shearer, Inter-County Telephone & Telegraph Co., Fort Myers; R. W. Shriner, General Telephone Co. of Fla., Tampa; Max Wettstein, Florida Telephone Corp., Ocala; Otto Wettstein, III, North Florida Telephone Co., Live Oak; E. D. Wilkinson, Southeastern Telephone Co., Tallahassee; C. J. Yates, Southern Bell Telephone & Telegraph Co., Jacksonville; and Hugh C. MacFarlane, attorney.

$106,900,000 In Loans Approved By REA For Telephone Borrowers In 1960

THE RURAL Electrification Administration reported last month that the number of subscribers benefitting from its telephone loan program reached 1,470,000 during 1960, when 190,000 more were added. The number of borrowers obtaining telephone loans increased to 727 in 45 states during the year, and included 515 commercial companies and 212 cooperatives.

Telephone loans approved last year amounted to $106,900,000, and funds advanced to telephone borrowers by REA totaled $105,000,000. There were 48 borrowers in 1960. Total loans to date to all telephone borrowers came to $737,000,000.

During the year, telephone borrowers paid $16,200,000 in principal and interest, including an increase of more than $1,500,000 in the amount paid ahead of schedule. Since 1949, when Congress authorized the telephone program, borrowers have repaid approximately $25,300,000 of principal, including a balance of $4,000,000 in the amount paid in advance of due dates. They have also paid $19,600,000 in interest. Only 11 telephone borrowers were delinquent in payments amounting to $311,570.

Favorable Outlook For Communications Industry Seen By BDSA In Annual Review

THE TELEPHONE industry in the United States anticipates that station growth this year will continue at about the same rate as in 1960, when there was an increase of approximately 3,650,000 telephones to bring the total in service to about 74,200,000, the Communications Industries Division of the Business & Defense Services Administration said last month in an annual outlook report.

The BDSA division reported that operating revenue for the industry last year is estimated at $9.1 billion. Construction expenditures are expected to total $2.9 billion for 1960, and industry estimates for 1961 indicate similar outlays, it was stated.

Average daily conversations, both toll and local, are increasing by about 14,000,000 above 1959, with the total for 1960 approximating 280,000,000, the report pointed out. Of the total about 10,200,000 are toll calls.

"Plant investment continues to rise in proportion to construction expenditures," the report continued. The total investment in the telephone operating industry at the end of December, 1959, was $26.34 billion, and by mid-1960 it had reached $27.34 billion.

Operating revenues rose from $8.4 billion in 1959 to an estimated $9.1

billion for 1960. Employment in the industry continues to hold steady at about 700,000.

A separate report covering the international telephone and telegraph industry declared that the "1961 outlook . . . is favorable," and predicted that gross revenues should continue their upward trend.

International telephone revenues were estimated at $37,000,000 for 1960, and "should exceed that amount slightly in 1961," while the principal carriers in the telegraph industry "expect international revenues in excess of $87,000,000 for 1960, and their projection for 1961 is moderately higher," BDSA stated.

The report attributed a "big increase" in overseas telephone service from 1956 to 1960 — with revenues rising from $15,802,000 annually to $37,200,000 — to the "expanding use of submarine cables." The increasing use of telex and leased circuits contributed to the rise in revenues for the international telegraph industry.

"Among other favorable factors affecting revenues is the leveling off in the decline on U. S. dollar value of certain foreign currencies and a relatively stable international situation favorable to further expansion of international telecommunications systems," it was stated.

A third BDSA report, covering the domestic telegraph industry (Western Union Telegraph Co.), said that revenues for this segment of the communications industry should total $275,000,000 for 1960, or about $4,000,000 under the 1959 total. Construction expenditures amounted to $50,000,000 last year and are a part of a plan to spend $150,00,000 in 1960-61.

Bell Lab's Research Director Sees Drawback In High Altitude Communications Satellites

SOME drawbacks to operating a satellite communications system calling for putting several satellites into orbit 22,300 miles above the equator were noted last month, by Dr. John R. Pierce, director of research in Electrical Communications at Bell Telephone Laboratories, in an address to the Princeton chapters of the American Rocket Society and the Institute of Radio Engineers.

Dr. Pierce pointed out that the speed of light is not fast enough for smooth conversation over such a system, and he said that a conversation transmitted between two distant points via the satellite would require a quarter to half a second in transit.

Because of this, he said, Bell Laboratories technicians experimenting with the problem found that conversation became awkward. Participants would begin to talk simultaneously, stop at the same time, and start again simultaneously, until they learned to adjust to the delay.

The Bell Laboratories official also predicted that the next step in space communications would be the launching of "some tens" of lower-level satellites with relay transmitters of one or two kilowatts, which would be useful for 10 to 20 years.

Inter-County To Erect New Office Building

GROUNDBREAKING ceremonies were held recently for the largest single commercial structure in Lee County, Fla. since 1924, and Inter-County Telephone & Telegraph Co., Fort Myers, Fla., one of the fastest growing telephone companies in the United States, displayed plans to erect an attractive new 50,000 square feet, multistory general offices building. The new $660,000 structure, designed by the architectural firm of Gunderson and Wilson of Fort Myers, will be located on the telephone company's property at the rear of its present buildings with a new public entrance.

J. N. Johnson, the company's president, said, "The additional floor space will be urgently needed by the last quarter of 1961 to provide room for additional new equipment and work space for the employes of the various operating departments of the company."

The 88-foot high structure will have six floors plus a penthouse which will be used to house an emergency generator, air conditioning equipment, commercial power transformers and electric switchgear, elevator mechanisms and a record room. The business offices will occupy the ground and mezzanine floors of the new building.

The second floor of the new structure will have the same floor level as the Toll Operating Room in the existing building. This additional floor space will provide adequate space for additional switchboards needed to handle the increase in long-distance traffic. The third floor will be utilized for the ladies lounge and toll equipment facilities. Toll equipment facilities are now located on the

Architect's drawing of new Inter-County Tel. & Tel. Co. building.

ground floor and this equipment will be moved to the third floor to make additional space available for local exchange equipment. Operating department heads and their staffs will occupy the fourth floor and the executive offices of the company will utilize the fifth floor. A 16-passenger self-operating elevator will be accessible from all floors.

The Inter-County Telephone System now has over 54,000 telephones in service and approximately 650 employes on its payroll. More than 400 of these 650 employes are located in the Fort Myers area, and over 300 are employed in the general offices buildings in down-town Fort Myers.

Inter-County Telephone System is the largest non-agricultural employer in Lee County. By comparison, 10 years ago the entire company had only 13,000 telephones and less than 200 employes. The population of the entire area served has increased from 49,000 in 1950 to 145,000 at the present time.

President Johnson reported that, "The provision of 50,000 square feet of additional floor space is a large undertaking, but at the present rate of growth it will only meet our requirements for less than 10 years. We have every reason to believe that the entire area population of this area will exceed 300,000 in the present decade and the number of telephones now being served will more than double."

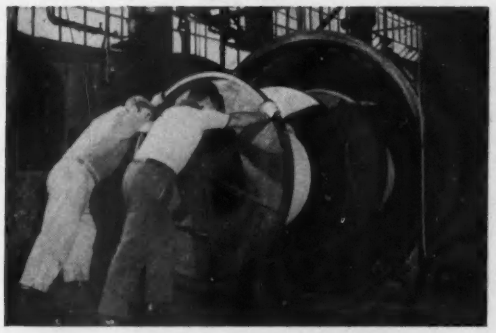
Iowa-Illinois Tel. Co. Purchases Mt. Pleasant Tel.

THE Iowa-Illinois Telephone Co., New London, Ia., has purchased a majority interest of the stock of Mt. Pleasant (Ia.) Telephone Co. and assumed management of the company. A. W. Sanders, executive vice president of Iowa-Illinois Telephone Co., announced the transfer and stated that no changes in personnel are contemplated. Roy Brandel will continue as manager of the Mt. Pleasant exchange and will be assisted by the present staff.

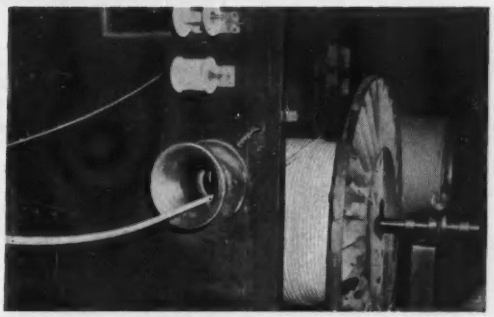
The new owner plans to proceed immediately with the conversion of the telephone plant to dial equipment, and contemplates that the improve-

How Kennecott Builds Extra Life into Telephone Cables

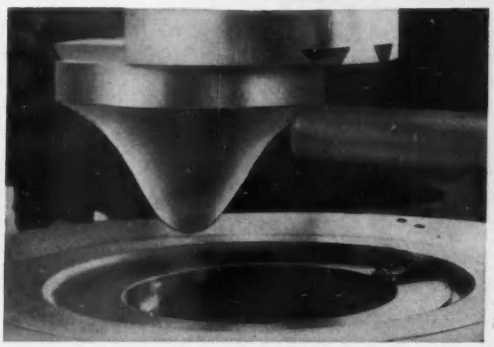
Constantly striving to improve their telephone cables, Kennecott's research and production team has established a three-step procedure that provides an exceptionally reliable and trouble-free cable.



1. VACUUM DRYING — For dependable performance it is essential that the paper insulation of telephone cables be properly dried prior to the application of the lead sheath. That is why the insulated core of every Kennecott telephone cable is thoroughly dried under controlled elevated temperatures and high vacuum in a sealed chamber.



2. PAYOFF OVEN — To maintain this dryness after removal from the vacuum chamber the reels are transferred to a payoff stand in an oven adjacent to the lead press. This manufacturing procedure prevents moisture from re-entering the insulation while the lead sheath is being applied.



3. YOUNG PROCESS—To enclose the cable in a lead alloy sheath that is uniform in strength and structure throughout the entire length of the cable, Kennecott uses an exclusive method of recharging the press cylinder—the Young Process. This technique removes the sulphides, oxides, and other impurities ordinarily present between charges. Thus each press charge readily and completely unites with the preceding charge, eliminating any possibility of defective welds.

For more information about the Young Process and for full details on Kennecott's Unit Type Paired Exchange Telephone Cable, send for your free copy of illustrated Bulletin 3001.

KENNECOTT-OKONITE TELEPHONE CABLE

ment program will be completed within two years. A new building to house the equipment and offices will be constructed.

Iowa-Illinois Telephone Company, a subsidiary of General Waterworks Corp., Philadelphia, Pa., together with General Waterworks' other telephone subsidiaries owns and operates 127 telephone exchanges in the states of Iowa, Illinois, Minnesota, Missouri, North Dakota and Utah, providing telephone service to 66,762 subscribers.

New Interior Official Active in Rural Tel. Co-ops

KENNETH HOLUM, who is to be Assistant Secretary of the Interior for water and power in the Kennedy administration, is president of the James Valley Telephone Cooperative, Groton, S. Dak., and president of the South Dakota Telephone Cooperative Association, it was reported last month.

J. W. Slemmons Named To Missouri Assn. Post

J. W. SLEMMONS, who was with the Northwestern Bell Telephone Co. for 17 years before he entered the truck and farm implement business in Iowa, became secretary-treasurer of the Missouri Telephone Association last month.

Slemmons, who served as manager of the Cuming County Telephone Co., Wisner, Nebr., immediately before taking over the Missouri association assignment, succeeds R. W. Hedrick, Jr., who is resigning to enter private law practice.

More Than Half Of World's Telephones In Service In U.S.

THE American Telephone & Telegraph Co.'s annual report on the world's telephone statistics points out that at the end of 1959 there were 133,600,000 telephones in service around the world, a gain of almost 9,000,000 over the previous year. All figures in the report are as of the end of 1959, as it takes a year to compile the statistics.

More than half the total telephones in service are in the United States, where the number was 70,821,000 at the end of 1959. Today, there are more than 74,000,000 in this country.

The U. S. also led the field in telephones per 100 persons, with 39.5. Brazil, with 1.48 telephones per 100, reported the smallest number per capita of the major countries. Russia was second from the bottom with 1.9 telephones per 100.

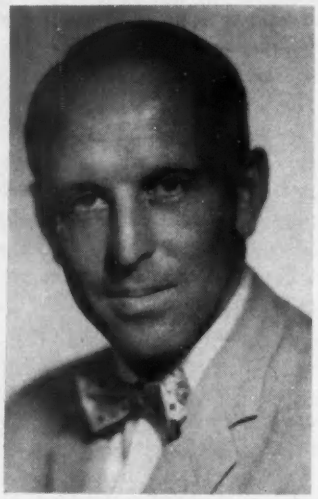
Canadians are the world's "talkingest" people, according to the report, which pointed out that they averaged more than 530 telephone conversations per person in 1959. Next was Iceland, with 508 conversations per person. The average in the U. S. was 496.

Since 1950, the report shows, the number of telephones in the world has almost doubled. The number in the U. S. increased 74% in that period, while in Asia, the number of telephones more than tripled. In Europe and South America, they doubled. No growth figures were available from Russia.

"We Switched The Captions"

We "goofed" on page 54 of the January 1 TE&M and placed the wrong captions below the photos of PAUL SAULNIER and DAVID STASTNY. Just to set the record straight here are the pictures with the captions in the right places.

General Cable Corporation has announced the transfer of PAUL SAULNIER to the Rochester sales office where he will serve as regional telephone manager covering the territories of Rochester, Buffalo, Syracuse, Boston, New Haven, Newark, New York City, Plainview, L. I., Philadelphia and Pittsburgh.



DAVID V. STASTNY has been added to the sales staff of Reliable Electric Company. He represents Reliable Electric in Maryland, Delaware and in eastern Pennsylvania, with headquarters in Philadelphia. He reports to District Manager Arthur Kelley. Stastny has had extensive experience in the utilities field.

North Dakota Commission Approves Phone Merger

NORTH DAKOTA'S Public Service Commission has approved the merger of the Dunn Telephone Mutual Aid Corp. and the Bowman-Slope Rural Telephone Mutual Aid Corp., both operating in the southwestern part of the state. The merged corporation will be known as the Consolidated Telephone Cooperative.

In another matter, the commission authorized Bowman-Slope Rural to increase its rates to the level of those maintained by the Dunn firm. Bowman-Slope operations are in Bowman, Slope, Hettinger, Adams and Golden Valley counties.

Southwestern And Illinois Bell Plan New Facilities

IN A JOINT application to the FCC last month the Southwestern Bell Telephone Co. and the Illinois Bell Telephone Co. asked authorization for the installation of 24 ON carrier sys-

tems between St. Louis, Mo., and Alton, Ill. at a cost of $148,020. It is estimated that by the end of 1961, the St. Louis-Alton group will have a load of 119% of present capacity if relief is not provided.

In another joint application last month, the New Jersey Bell Telephone Co. and the Bell Telephone Co. of Pennsylvania requested approval for the construction of 6 N-1 systems between Washington, N. J. and Easton, Pa., and N-1 systems between Morristown, N. J., and Easton, to cost a total of $77,300.

Dr. Harold S. Osborne Receives AIEE Medal

DR. HAROLD S. OSBORNE, retired chief engineer of the American Telephone & Telegraph Co., last month was named recipient of the Edison Medal of the American Institute of Electrical Engineers. The medal was presented at the AIEE's winter general meeting in New York City, Jan. 30.

Dr. Osborne, who was chief engineer of AT&T from 1943 until his retirement in 1952, was cited for "his contributions to the art of telecommunication and his leadership and vision in extending its application; for his achievements in the coordinaton of international communication and national international standardization, and for the advancement of the engineering profession."

Mobile System Planned At Lake Wales, Fla.

IN THE domestic public land mobile radio service, General Telephone Co. of Florida last month asked FCC authorization for construction of a 100-unit mobile radio telephone system at Lake Wales, Fla.; approval of 100-unit service at Desert Hot Springs was requested by Industrial Communications Systems, Inc.; and the Clay County Rural Telephone Cooperative, Inc. asked FCC approval for a 15-unit system near Cloverdale, Ind.

AT&T Stockholders' Meeting Scheduled For Chicago

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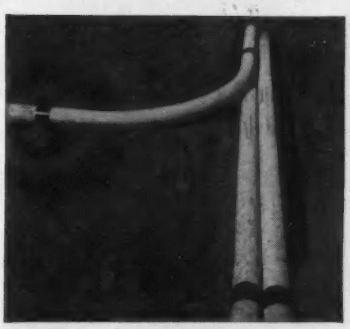

Transite ducts require little, if any, maintenance. The permanently tight joint keeps out water-borne silt and dirt. What's more, it permits pneumatic rodding which can save you 5¢ a foot. No wonder one out of every four feet of telephone duct installed in 1959 was Transite. For further information write Johns-Manville, Box 14 TE-2 New York 16, N. Y. In Canada: Port Credit, Ontario.

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holders than any other company in the world, will hold its annual stockholder meeting in Chicago's McCormick Place April 19. This 76th annual meeting will be the first ever held anywhere outside New York City.

The meeting is believed to be the biggest stockholder gathering in the United States. It will be the biggest annual meeting ever held in Chicago. At least 5,000 persons are expected to attend.

AT&T is taking advantage of a 1957 New York law that permits three of five consecutive annual meetings to be held out of state. Before 1957, New York corporations had to hold all meetings there.

James W. Cook, AT&T vice-president in charge of public relations, said he had no idea how many of AT&T's 1,900,000 stockholders would attend the Chicago meeting. More than 11,000 attended each of the last two meetings at New York City. Cook stated that AT&T has about 150,000 owners in the immediate Chicago area and another 150,000 in several adjacent states. Forty-two per cent of the company's stockholders live in the New York area.

About 100 AT&T officers, directors and employes will travel to Chicago from the New York headquarters to participate in the meeting, which Cook estimated might cost $100,000.

Cook said the Chicago meeting is not part of a plan to shift the annual meeting site to different places. "We want to see how this one works out before we make any plans for 1962," he commented.

Bell Of Canada Expects Construction Record in 1961

BELL TELEPHONE CO. of Canada expects construction expenditures in 1961 to equal the record-high investment of more than $200,000,000 for service and improvements made in 1960, President Thomas W. Eadie said in a year-end review.

In describing 1960 "as a year of well-maintained progress, despite a business climate less favorable than during 1959," Mr. Eadie noted that more than 180,000 telephones were added last year to bring total in service to 3,500,000, of which 94% are dial operated. Long distance calls also rose in number in 1960, although at a slower rate than in 1959.

Southwestern States Tel Co. Plans $9 Million Expansion

A RECORD-HIGH expansion program totaling over $9 million has been announced for 1961 by The Southwestern States Telephone Co. The company serves 158 telephone exchanges in Texas, Oklahoma, Arkansas and Louisiana, and has general offices at Brownwood, Texas.

D. T. Strickland, vice president and general manager, said $9,351,470 had been budgeted to expand and improve telephone facilities and to keep up with telephone demands in the growth areas served by the company. This represents a 34% increase over the 1960 construction program.

With 93% of the company's 153,000 telephones already dial operated, the company will continue its dial conversion program in 1961 with dial cutovers at Llano, San Saba, Menard,

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and Leonard — all in Texas. Only six exchanges will be served on a non-dial basis by the end of 1961. The company's Arkansas and Louisiana properties are now dial operated.

Major expansion is scheduled again in 1961 in fast-growing Irving, Texas, where equipment additions alone are estimated to cost about $1 million.

"Our 1961 expansion program is an indication of the faith we have in the future growth and development of the Southwest," Strickland explained.

The Southwestern States Telephone Company is the 16th largest of over 3,500 Independent (non-Bell) telephone companies in America.

Bell Of Pa. Announces $122 Million Construction Program

FOR THE sixth consecutive year, the Bell Telephone Co. of Pennsylvania will spend in excess of $100,000,000 in 1961 on its construction program, President W. D. Gillen said last month in a year-end statement. Expenditures are expected to total $122,300,000 this year, compared with $117,133,000 in 1960.

The number of telephones served by the company increased by 161,000 last year, a growth rate of 3.9%, to bring its total in service in the state to 4,306,000.

Commission OK's New Plan For GT&E To Acquire Orange County Tel.

THE NEW YORK Public Service Commission has approved a modified joint proposal of the Orange County Telephone Co. and General Telephone & Electronics Corp., under which the latter will acquire the ownership, through voting control, of the Orange County company. The state commission had rejected an earlier acquisition plan involving the companies.

The new proposal does not involve consideration of the plan of reorganization under which ownership of the physical plant of the Orange County company might, at some future date, to be transferred to General Telephone Co. of Upstate New York.

Under the approved plan, Orange County Telephone may now reclassify its outstanding 50,000 shares of

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common stock as "Class A" stock, with each share having one vote, and issue and sell to GT&E 30,000 shares of a new "Class B" common stock, each of which will have 1.7 votes. Acquisition of that stock, to be sold at not less than $38.31 per share, will give General a 51% controlling interest in Orange, which serves about 17,500 subscribers.

Neb. And Colo. Propose "Phone Hog Bills"

A BILL introduced in the Colorado legislature would provide a fine up to $1,000 and a 90-day jail sentence for refusing to yield immediately the use of a telephone party line for an emergency call.

Sponsored by Senator Earl A. Wolvington of Sterling, the measure also would penalize persons who falsely request use of a party line on pretext of an emergency. This would call for a possible fine of $100 and a 10-day jail sentence.

A bill introduced in the Nebraska legislature would make it a misdemeanor to refuse to relinquish a telephone party line in certain emergencies. The measure is listed as LB 121, by Klaver.

London To Have An Electronic Exchange

LONDON soon is to have an electronic telephone exchange the American Institute of Electrical Engineers was told in New York City on February 3. The system resulted from a research and development program inaugurated in 1956 by the Joint Electronic Research Committee, composed of the General Post Office, which supervises telephone service in the United Kingdom, and its five principal suppliers of telephone exchange equipment.

"A 100-channel 4-wire t.d.m. (time division multiplex) exchange will be factory manufactured by 1961 and is to be installed at Highgate Wood in the London area in parallel with a new normal programme exchange," a communication switching symposium was told by T. H. Flowers, of the British Post Office, London, and G. Forshaw, of the Automatic Telephone and Electric Co., Ltd., Liverpool.

When commissioning tests have shown the electronic exchange to be suitable for public service it will be cut-over and cut-back only if some major difficulty arises. It is planned to have a Mk. II system in service operation by 1965. The trial of other than 4-wire t.d.m. type of exchange is dependent on the results of the studies which are now taking place.

Two outstanding problems are "reliability and security." Reliability is measured by the rate at which faults appear and have to be cleared. Over the whole range of electronic components and taking into account their relative numbers, a fault rate of about one fault per 2000 components per line, is currently being quoted. With an average of 50 components per line this means one fault per 40 lines per annum, which is comparable with electromechanical fault rates but not good enough for ready acceptance of electronic systems.

Security is defined as "the effects of faults on the service to the customers, and particularly the denial of service to some or all of the lines on an exchange."

"New 'Telpak' Telephone Service"

(Continued from page 48)

riers, in their view, must offer service comparable in price and form, or lose both existing and future business.

It is felt that there are definite economies in the telephone company method of operation, in terms of the companies' ability to combine the requirements of a number of customers. Telpak is intended to make use of wide frequency bands to provide the customer with features available to him through private microwave systems.

Present private line rates of common carriers, however, are not felt to be fully competitive with private microwave systems for bulk services, since they do not fully reflect the economies of providing wide bands to customers.

At the same time, in the view of the telephone companies, Telpak should benefit other telephone subscribers, since the rates are set at a compensatory level for business which would be lost to the private systems.

Meanwhile, telephone companies are constructing large amounts of broadband facilities to meet growing demands for other telephone services, and whether or not Telpak is provided along with the other services is principally a matter of investment. At the same time, in the view of the telephone companies, Telpak is in the interest of the other ratepayers, since it enhances the tendency of the average circuit mile cost to decline as the route density increases.

It is estimated that about 35,000 miles of private microwave systems already have been constructed for the relatively limited number of users — petroleum, power, railroad, state and local government, for the most part — which were eligible under earlier FCC rules.

While interest in private systems, under the previous rules, was restricted mainly to long-haul systems, the new rules have brought about a growing interest in the short-haul tie-in type of operation, such as for department store chains in large metropolitan areas.

It is felt that there may be as many as 1000 business organizations which are clearly potential Telpak customers, in upwards of 50 different business categories.

A fractional system is provided under the tariff for computation of interstate and intrastate rates. Where both types of channels are involved, a ratio will be applied to the interstate channel rate consisting of the number of interstate equivalent voice grade channels in use to the total number of equivalent voice grade channels in use. A similar computation would take place on the intrastate side. Between two specified points, 100% of the equivalent voice grade channels would be charged for at either the interstate or the intrastate rate.

PERMANENT SUPPORT

for your Poles

and Aerial Cables

ALUMOWELD®

guy and messenger strand

You can forget all about maintenance costs when you install Alumoweld Strand. This low-cost guy and messenger strand is designed to last as long as the pole it guys or the cable it supports.

A thick cladding of pure aluminum gives Alumoweld the same high resistance to corrosion as solid aluminum. This protective aluminum covering, which will never crack, flake or peel, is inseparably welded to the steel core by the unique controlled atomic-welding process. As a result, the strong steel core is constantly protected against corrosive attack and its original high strength is permanently maintained.

Alumoweld is as strong as steel. And its light weight—18% less than steel of comparable diameter—makes it easier to handle, easier to install.

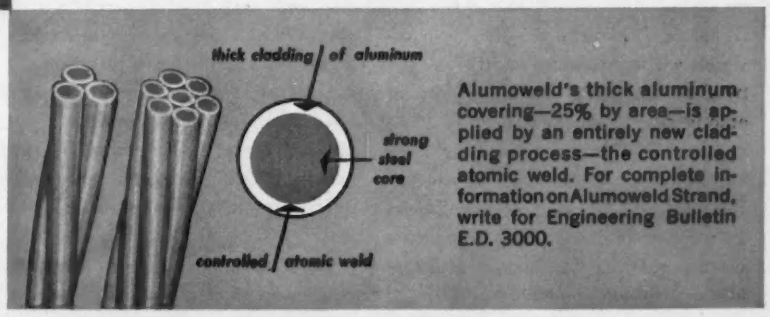
Supplies of Alumoweld Guy and Messenger Strand are available for prompt shipment to you from our warehouses in New York, Chicago, Pittsburgh and Memphis.

COPPERWELD STEEL COMPANY

WIRE AND CABLE DIVISION Glassport, Pa.

For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

Canadian Distributor: NORTHERN ELECTRIC COMPANY LIMITED



Alumoweld's thick aluminum covering—25% by area—is applied by an entirely new cladding process—the controlled atomic weld. For complete information on Alumoweld Strand, write for Engineering Bulletin E.D. 3000.

Founder of Electra (Texas) Telephone Co., A. L. Robb, Dies Following Short Illness

FUNERAL services for A. L. Robb, founder of the Electra (Texas) Telephone Co., who died January 17 in a Dallas hospital following a short illness were held in Electra on January 19.

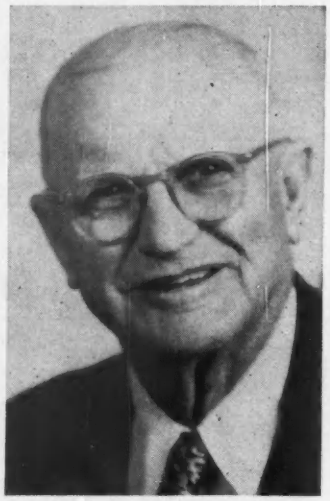
Born July, 1882, in Norris City, Ill., Mr. Robb went to Texas in 1900 and worked for the Sante Fe Railroad in New Mexico and the Mexican National Railway in Mexico before moving to Electra in 1907.

He began his telephone career with the purchase of a half interest in the Harrold & Electra Telephone Exchanges. He sold the Harrold Company and kept ownership of Electra.

The company has grown from 22 telephones in 1908 to approximately 2400 today. He was married to the former Lovie Morris of Nocona in 1908.

He was interested in dairying, farming, and stock farming from about 1928. He retired from active participation in the telephone business in 1945 and devoted his full time to farming and stock raising.

Robb was one of the first chiefs of the Electra Fire Department, and was one of the founders and first Boss of the Electra Chuck Wagon Gang, and a member of the Men's Class of the First Methodist Church.



Veteran Independent A. L. ROBB, dies following short illness.

He was serving as a director of the Texas Telephone Association, and as the first and only president of the Electra Federal Saving and Loan Association, and as vice president of the Electra State Bank.

Mr. Robb is survived by his widow and son, Dink, of Electra; two sisters, Mrs. Vine Green, Electra, and Mrs. Grace Nelson of El Paso; one granddaughter, Mrs. Martin McCarty, and two great-grandsons, Tony and Terry McCarty of Electra; and several nieces and nephews.

General Dynamics Electronics Organized: St. Carlson, Convair-Electronics Form New Div.

FRANK PACE, Jr., chairman of General Dynamics Corp. has announced the creation of a new division of the corporation, General Dynamics/Electronics. The new division will consolidate separable electronics activities formerly spread among several divisions.

"General Dynamics has long been an important electronics producer," Pace said. "Our sales volume places us well up among the top companies in this growing industry. Our capabilities, however, have been diffused among several of our existing divisions. By concentrating the research, production and sales effort of our electronic end products within a single division, we expect to increase our market share more rapidly."

General Dynamics/Electronics will absorb the former Stromberg-Carlson Division plus those electronic products of other divisions which are, or can be, marketed as separate entities.

Pace pointed out that electronic equipment is also an integral part of aircraft, submarines, missiles, and space vehicles. Products, facilities, and personnel to be transferred to the new division, he said, have been selected carefully to avoid eroding research, engineering and manufacturing capabilities essential to primary General Dynamics military products. Systems and components integral to these major weapons remain with the original divisions.

The capabilities of the new division, Pace added, already encompasses a wide range of products and services in industrial, military, commercial and consumer electronics. Included in its areas of activity are: communications; weapon electronics; telephony; home electronics; navigation aids; data processing; microminiaturization; radar; air traffic control; guidance systems; and systems management.

James D. McLean, president and general manager of the Stromberg-Carlson Division has been named president of General Dynamics/Electronics. George J. Dickey, formerly vice president of Stromberg-Carlson, becomes vice president and general manager of the new division.

General Dynamics/Electronics will continue its manufacturing and research in existing General Dynamics facilities in Rochester, N. Y., San Diego and Los Angeles, Calif. These facilities total more than two million square feet of floor space. Employment of the new division is over 11,000 persons.

"We feel this move will strengthen our position in electronics both in end products and in support operations to weapon systems," said Pace. "It will provide more rapid development for both areas, and give us greater flexibility to move rapidly into new and profitable fields."

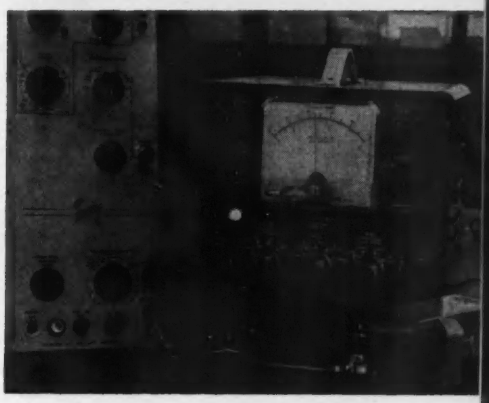
Establishment of the new division, the General Dynamics' chairman added, will lead to a stronger electronics identity for the company. The Stromberg-Carlson trade name will remain on telephone equipment and commercial and consumer sound systems, but all other divisional products will carry the General Dynamics/Electronics label.

General Dynamics/Electronics will

At Last!

(someone did it)

A PULSE METER



that is compact, easily carried, and plugs into the nearest 115 volt, 60 cycle ac wall outlet. Developed by telephone men FOR telephone men, our new pulse meter and power supply measures dial pulses from 0 to 15 pulses per second and percent make from 0 to 100 percent. It will accept loop, ground, battery, carrier, and polar-duplex pulses. Simple in operation, it can be easily carried and used at the test board, the telephone instrument repair bench — any place in the telephone exchange. For that matter, it can easily be moved to the actual subscriber instrument if the need arises. As an added bonus, the PMVPS-1 also gives you a dc power supply continuously variable from 0 to 300 volts. Use it to check transistor circuits, vacuum tube circuits, as a standby power supply—the sky is the limit! Best of all, you will be surprised that so much can be purchased for such a low price!

AIRTRONICS INTERNATIONAL CORPORATION

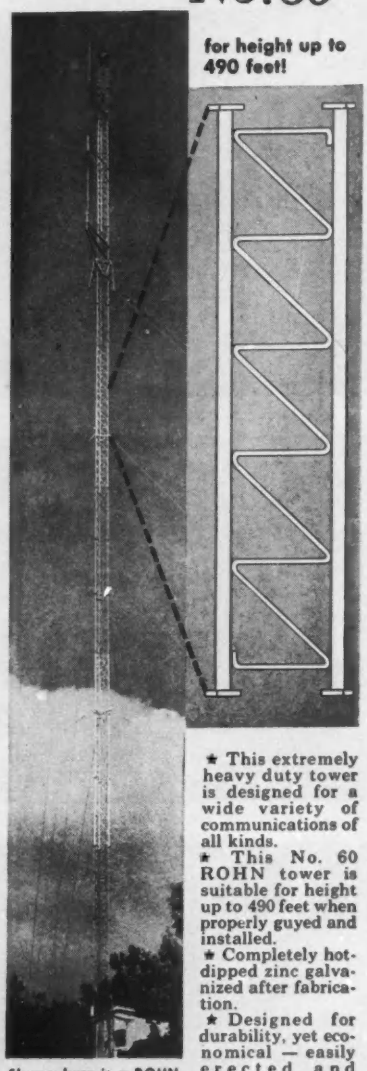
P. O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

other product FIRSTS from Airtronics:

- Program Equalizers
- Portable Test Hybrid Sets
- Artificial Transmission Lines
- Line Matching and Terminating Sets
- Switch Gain Amplifiers
- Pulse Meters
- Transmission Measuring Sets

ROHN COMMUNICATION TOWER *No. 60*

for height up to 490 feet!



Shown here is a ROHN No. 60 tower installed to a height of 200 feet with 3 five-foot side arms, mounting antenna for police radio communications.

★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.
★ This No. 60 ROHN tower is suitable for height up to 490 feet when properly guyed and installed.
★ Completely hot-dipped zinc galvanized after fabrication.
★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

FREE

Details and complete engineering specifications gladly sent on request. Also ROHN representatives are coast-to-coast to assist you.

Write-Phone-Wire Today!

ROHN *Manufacturing Co.*
Box 2000,
Peoria, Illinois
Phone 637-8416
"Pioneer Manufacturers of Towers of All Kinds"

consist of four operating divisions: Commercial Products, Telecommunications, Military Products, and Information Technology. The Telecommunication Division and the Commercial Products Diyision will be located in present Stromberg-Carlson facilities in Rochester, N. Y. The Military Products Division will occupy on the same scale present Stromberg-Carlson facilities in Rochester and existing Convair Electronics facilities in San Diego. The Information Technology Division will be housed in present Stromberg-Carlson facilities in San Diego. Research operations will continue in Rochester.

Research activities are also being expanded, Pace said. In addition to current major projects in such fields as digital communications, electroacoustics and propagation techniques, further emphasis will be placed upon studies in infrared technology, information display, systems research and operations research.

Among the fields planned for immediate expansion, Pace stated, are data handling, process controls and instrumentation. He added that the increased activities should have a positive growth effect in all areas where General Dynamics/Electronics has facilities.

C & S Products Appoints New Representative

C & S PRODUCTS CO., Windsor Locks, Conn., has announced the appointment of the Fleming Engineering Co., Inc., as representatives for the complete line of Semper-Seal cable splice and blocking compound products in Texas and Oklahoma. John C. Fleming, the principal officer of the Fleming company maintains offices in Fort Worth, Texas.

Stromberg-Carlson Advances Delaney And Winslow

DONALD F. DELANEY and Edward R. Winslow have been promoted to sales engineering posts in the Rochester, N. Y. branch of Stromberg-Carlson's Telecommunication Division.

Delaney has been in the telecommunications industry since 1942, except for three years on military duty. He started with Stromberg-Carlson in the cable department and was later promoted to the production control section. He gained experience in the internal sales department and was then given territorial responsibility in the national sales engineering group.

Winslow has been the company's assistant chief installer. He began his service with Stromberg-Carlson in 1951 as an installer. Later he was made an installation foreman and worked on several large "XY" dial installations in Florida, California and Minnesota. He then joined the Rochester main office as a technical field service engineer before assuming the post of assistant chief installer. Prior to joining Stromberg-Carlson Winslow was associated with the New England Telephone & Telegraph Co. in Lewiston, Maine.

U. S. Instrument Names Hoy, Materials Manager

UNITED States Instrument Corp., Charlottesville, Va., has announced the appointment of Edward F. Hoy of Rochester, N. Y. as materials manager.

He will be in full charge of all functions of planning requirements, procurement, receiving, storing and shipment of material.

Hoy was manager of production planning for Stromberg-Carlson, Rochester, N. Y., and he has held various supervisory positions in production and material control with General Electric in Somersworth, N. Hampshire.

According to USI President W. A. Rockwood, USI's program of orderly expansion in the last year and a half has included a 100% increase in production, warehousing and parking facilities as well as an addition of nearly 200 employes.

Cook Electric Company Increases Sales Force

BRUCE F. BOND has recently joined Cook Electric Company's sales forces and will be located in San Francisco. Bond had worked in the company's sales service department and previously had several years asso-

WILKINSON LINE LOCATOR

Pat. Pend.

WILKINSON PRODUCTS COMPANY

3987 Chevy Chase Drive, Pasadena 3, California

TEL: SYlvan 0-4314

MINIATURIZED PRECISION
WILKINSON LINE LOCATOR Model W-3

A radically new, advanced design in electronic locators for all sub-surface installations — transmissions and distribution lines, cables, valve boxes, buried structures under ground and in walls.

True miniaturization has been made possible by use of transistors, subminiature batteries, components, etched circuitry and transistorized single ear set.

GENERAL SPECIFICATIONS

Size: Receiver — 8" x 3½" x 2½". Transmitter 8" x 3½" x 2½". The set also includes a substantial carrying case. The head set is a single ear transistor type.

Weight: 4 lbs. total, including transmitter, receiver and telescopic connecting handle.

Instrument Cases: Molded glass fibre construction.

Power: High gain type, highly sensitive and accurately controlled.

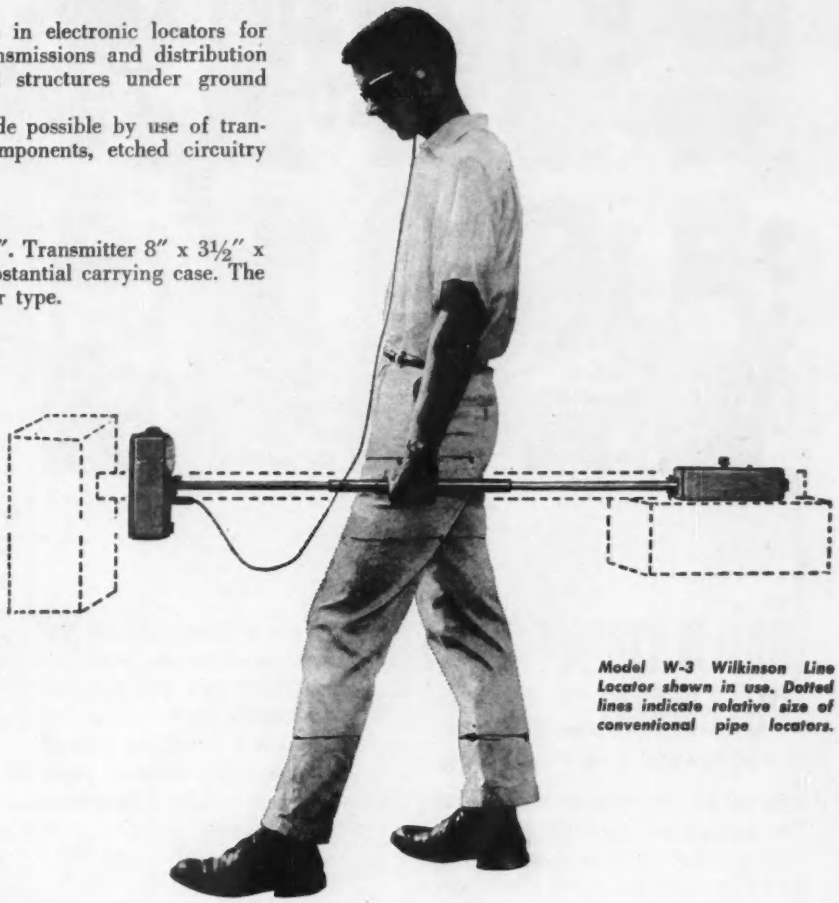
Battery Life: The over-all battery life is ten times that of the conventional locating devices previously available. Mercury "A" cells, non leak miniature size.

Circuitry: The circuits are etched instead of hand wired.

Antennas: New and unique application of miniature "Q"-core antennas.

Shock Resistance: The glass fibre cases, soldered-in transistors, etched circuits and secure mounting of miniature components eliminate the usual hazard of shock common to the previous type locators.

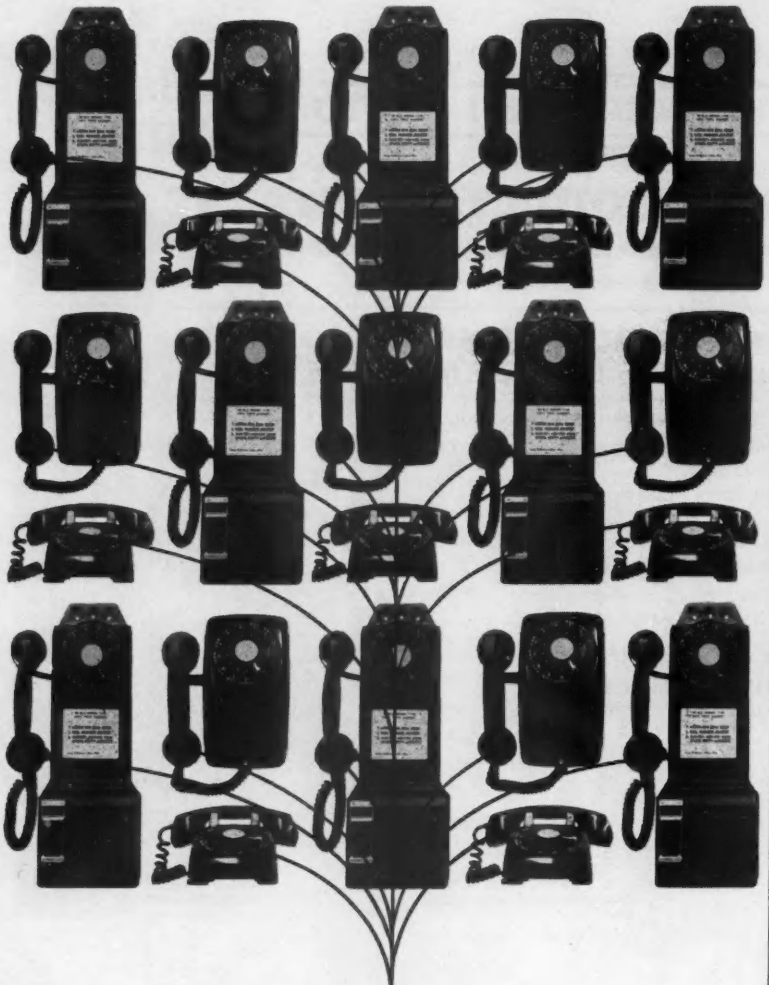
Maintenance: The Wilkinson Line Locator Model W-3 is virtually maintenance-free because of its advanced mechanical and electronic design. The transistors have a rated life of approximately 70,000 hours use. Transistors, resistors and capacitors are soldered into the circuit.



Model W-3 Wilkinson Line Locator shown in use. Dotted lines indicate relative size of conventional pipe locators.

The compactness and light weight of the Wilkinson Line Locator Model W-3 . . . its miniaturization and extremely high sensitivity provide users the ultimate in line locating instruments. It can be used in very close quarters . . . for detecting and tracing cables, pipes and the like in wall installations. Because of its light weight, operators do not experience fatigue. The W-3 functions both inductively and conductively, separated, or assembled on the handle.

Distributors in Principal Cities. Descriptive brochure upon request.

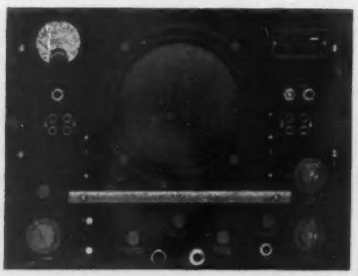


BUILD YOUR PROFIT POTENTIAL

Reduce Testing Time and Make Optimum Use of High-Cost, Experienced Personnel

You can meet the challenge of modern, ever increasing service demands; the far more stringent test requirements resulting from D.D.D.; by application of the new Hallamore designed and manufactured Swept Band Transmission Test Set. This unique instrument affords fast, completely accurate transmission measurement (including repeater or amplifier gain, determination of return losses, and location of loading faults). Readings are in visual form, easily photographed to provide a permanent record.

Range is from 200cps to 4000cps. Unit may be rack mounted or may be used for greater mobility on a Hallamore test wagon. Accessories include a Hybrid Test Set, Camera Attachment, and Artificial Lines. For detailed information, please write Hallamore, Telephone Department, 714 No. Brookhurst St., Anaheim, California. PRospect 4-1010, D.D.D. area 714.



Division of The Siegler Corporation

HALLAMORE

Repeaters/Test Equipment/Repair, Rebuild, Color Subscriber's Apparatus/Closed Circuit TV

ciation with the Wisconsin Telephone Co.

With this addition, William D. Holcomb, manager of the company's Wirecom Division announced completion of the first phase of Cook Electric Company's expansion pro-

BRUCE F. BOND

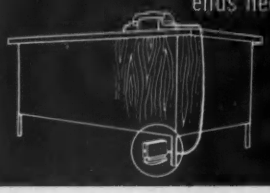
gram in the telephone industry. The company, a supplier to the telephone industry since 1897 has increased its nation-wide coverage through the addition of field personnel in all areas. The entire group is versed in the many facets of the telephone companies' business and are bolstered by the division's chief engineer, veteran telephone man, Leonard Ruggles.

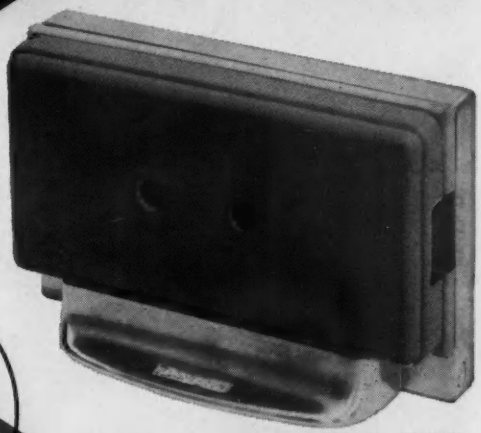
The following is a list of Cook Electric Company's sales crew covering the telephone industry, and the areas of their activities:

Bruce F. Bond, San Francisco, Calif., (Wash., Ore., Idaho, Mont., Wyo., Alaska); William J. Brady, St. Paul, Minn., (N. D., S. D., Minn., Wisc., Ia.); Charles C. Browne, Kingfisher, Okla., (Ark., La., Texas, N. M., Okla.); Walter T. Comerford, Bristol, Tenn., (Ky., Va., Tenn., Dela., W. Va., N. C.); Robert B. McMahon, Toledo, Ohio, (Ind., Mich., Ohio); Edward J. Perkins, Tujunga, Calif., (Ariz., Utah, Southern Calif., Colo., Southern Nev., Hawaii); Warren S. Richardson, Tallahassee, Fla., (Miss., Ala., Ga., S. C., Fla.); Howard A. Utech and Donald J. Turner, Warwick, N. Y., (Conn., Maine, N. J., Md., Mass., N.

FLOOR-CON TELEPHONE FLOOR CONNECTOR

keeps desks free from all telephone equipment . . .
ends needless marring of office furniture





gives you beauty, uniformity and economy!

Floor-Con allows all telephone installation work to be completed in advance of moving. All wiring is concealed. Approved and specified by telephone companies, Floor-Con is used exclusively in many large buildings in business, industry and government. Floor-Con attaches to all types of underfloor duct systems, flush type floor boxes, single conduits, through the floor—or if conduits are not provided, screws directly to the floor.

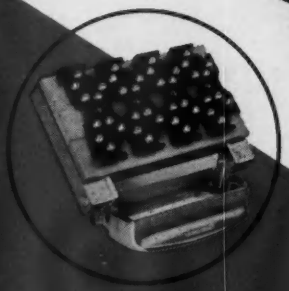
Comes in four plated finishes: Chrome—satin or bright, and Brass—satin or bright.

All necessary fittings will be supplied to adapt Floor-Con to your particular duct system or floor installation—please specify the type or make in use.

MODEL 104 shown with standard telephone equipment, accommodates up to 8 No. 44-A Connecting Terminals (4 on each side).

MODEL 102 accommodates up to 6 No. 44-A Connecting Terminals (3 on each side).

Or, the back of either model may be used for flush-mounted chargers, buzzers or auxiliary equipment.



(Pat. No. 2854166)

For catalog information and prices, write:

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710 North Spring Street / Los Angeles 12,
California / Telephone: MAdison 4-5400

Concise, practical, and complete, this handbook will serve you day in and day out with dependable results.

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INDUSTRIAL ELECTRONICS HANDBOOK

Prepared by a Staff of Specialists

Edited by WILLIAM D. COCKRELL General Electric Company

1408 pages, 6 x 9, 969 illustrations, 149 tables, $22.50

Any engineer or technician concerned with the design or use of industrial electronic equipment will find this Handbook of constant help. All of the material in it has been selected for its practical utility. Language and mathematics have been kept simple and graphical since experts in one area of this rapidly expanding field are often novices in another.
To almost every subject it covers this Handbook offers you an amazingly fresh approach. For example, most modern techniques such as magnetic amplifiers, logic circuits, transistors, and computers have been written about by the men who helped develop them.
You'll find the sections on mechanical design, user requirements, and technical information truly unique in their concept. Even in the basic sections such subjects as binary arithmetic, Laplace transforms, and an extensive article on servo theory combine much original material of special interest to the electronic systems engineer.

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A Directory for the
Pioneer Telephone Company

Printed by
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350 East Twenty-second Street, Chicago 16

H., N. Y., Pa., Vt., R. I.); Milton E. Vail Springfield, Mo., (Ill., Kans., Mo., Neb.).

R. B. Fulton Named President Sequoia Wire & Cable Co.

LAST MONTH Robert B. Fulton was elected president of the Sequoia Wire & Cable Co., subsidiary of the Anaconda Wire & Cable Co.

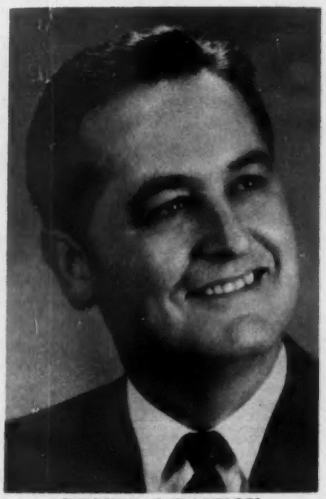
Other company officers elected by the board of directors are William L. Grey, executive vice president; James L. Vincent, secretary and treasurer; and Herbert B. Fields, assistant secretary and treasurer. Directors named are: David E. Allen, William H. Benton, Fulton, Grey, Vincent, Richard B. Steinmetz and John L. Tindale.

Fulton has been manager of the Orange, Calif. plant of Anaconda since 1958, and has held several important supervisory and executive positions with Anaconda in this country and Mexico.

He represented Anaconda at Conductores Electricos, S. A. in Mexico City from 1956 to 1958. Anaconda has an interest in the Mexican wire and cable company. Prior to that, he had been superintendent of the Anaconda plant at Hastings-on-Hudson, N. Y.

General Tel. Directory Names Division Mgrs.

LESTER J. ("Les") Barton has been named division manager of the General Telephone Directory Company's Muskegon, Mich. division, and Theodore J. ("Ted") Mertens has been advanced to division manager, Spokane, Wash.



LESTER J. BARTON

THEODORE J. MERTENS

Prior to their promotions, Barton

RADIO PAGING TRANSMITTER

Designed especially for one-way voice paging or radio signaling, the new Budelman Type B-250-VA4 is the *standard* of the telephone industry.

POWERFUL

1000 watts of peak output power (100% modulation) is achieved. Only 400 watts input to final RF amplifier is required to produce a 250-watt carrier.

RELIABLE

For use 24-hours-per-day. Extreme *reliability* is built in.

VERSATILE

For operation on any frequency in the 30-50 MC band. Speech clipper and low-pass filter suppress unwanted sidebands and prevent overmodulation . . . ideal for voice or tone transmission.

Many Budelman Type B-250-VA4 transmitters are now in service, earning more income for the telephone industry.

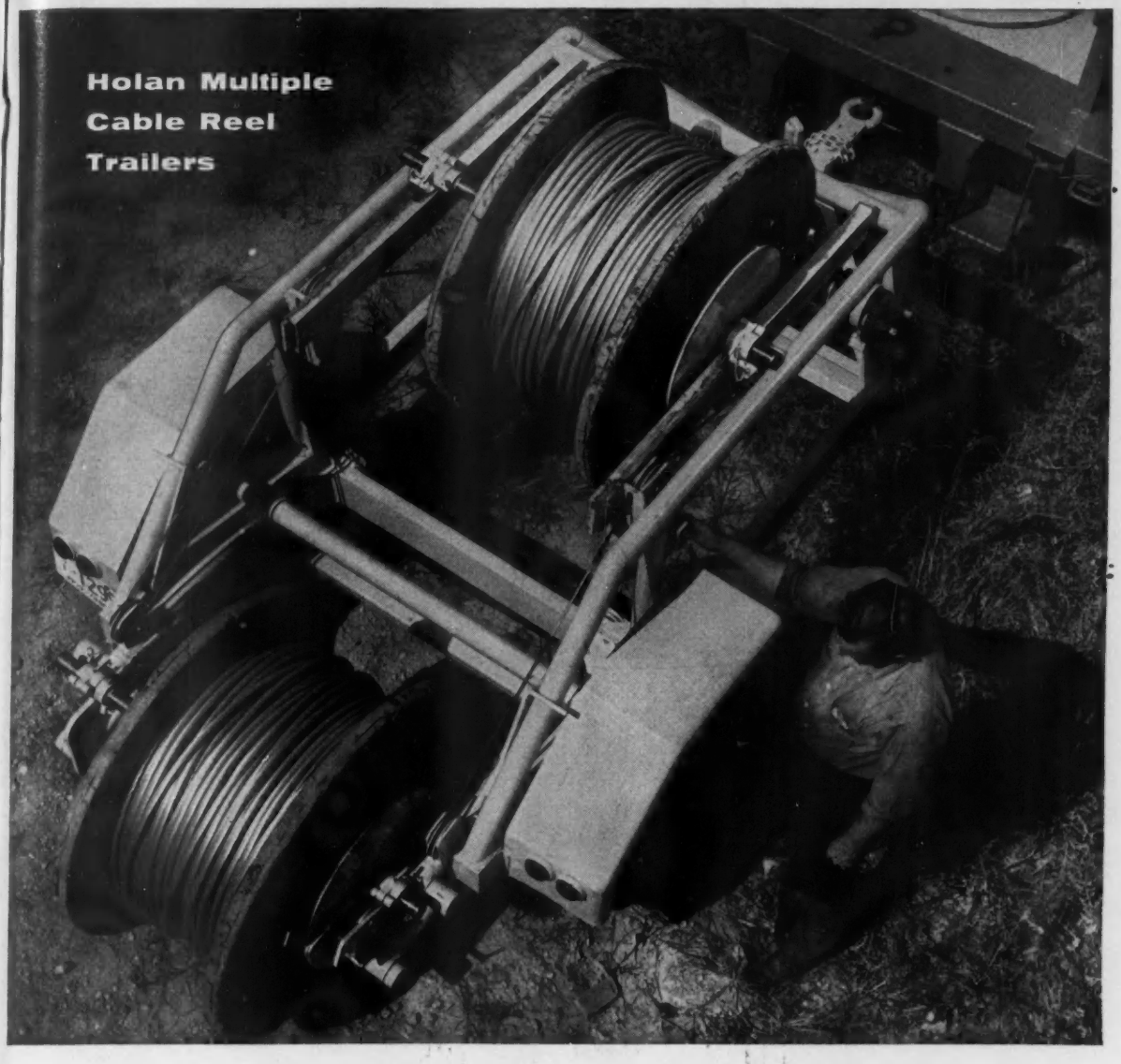
For assistance in planning your own Radio Paging Service, call your Budelman distributor or write to the factory.

BUDELMAN

ELECTRONICS CORPORATION

375 FAIRFIELD AVENUE STAMFORD, CONNECTICUT

TELEPHONE 203-FI-8-9231



Make reel loading a one-man job

One man can load two cable reels and be on his way in three minutes with a Holan Multiple Reel Trailer.

Such speedy handling of heavy reels of cable by one man is possible because of simple, safe, functional design and a patented loading device.

Holan offers a complete line of 1-, 2-, 3-, and 4-reel trailers —all incorporating the same design features that assure safe, fast, economical operation by one man.

Pickup arms lower to within 12″ of the ground, handle reels as small as 24″ and as large as 54″ without any special attachments and without any heavy lifting by the operator.

A pushbutton controlled electric winch or hand winch lifts the reel into place. Both are located away from the hoisting mechanism, thus assuring that the operator stands clear of the reel while loading and unloading.

The electric winch is designed to prevent overloading of the lifting cable—even if the operator continues to apply power after the lift arms have reached maximum height. Reels roll freely to forward positions on spindle bars of sufficient length to support them in the event careless handling should cause the reels to shift from side to side or out of square.

Exclusive 22″ electric disc brakes eliminate overspin, give positive braking action, and provide tension for reconductoring.

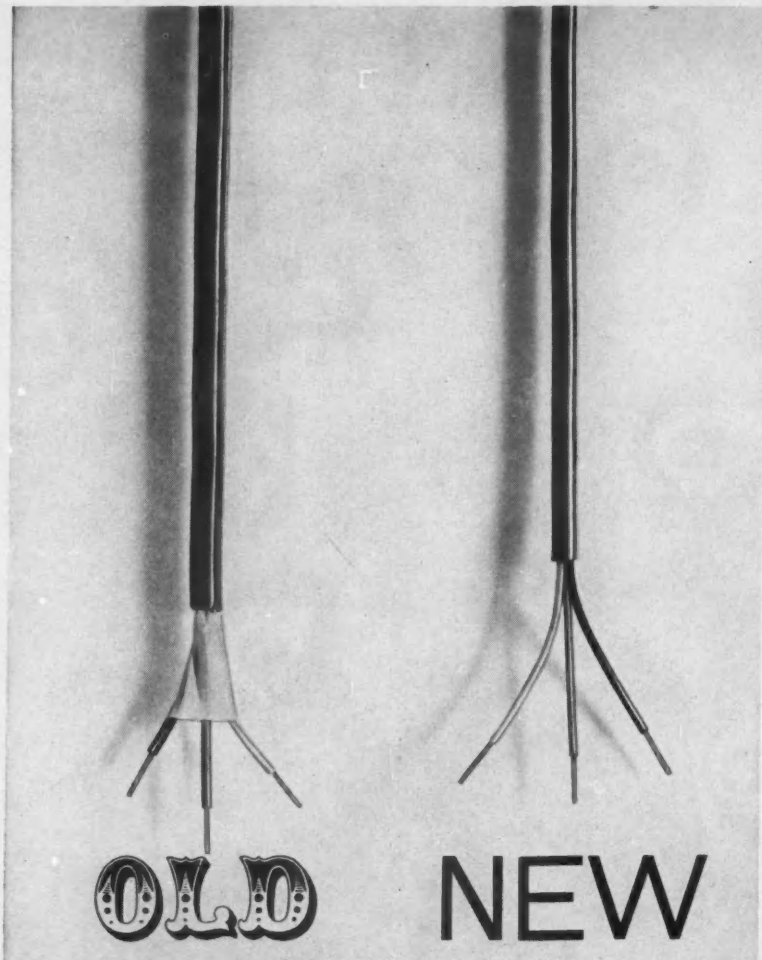
Write today for your copy of the Multiple Cable Reel Trailer brochure—or ask your Holan Field Representative for the facts that prove reel handling can be a one-man job.

Holan Corporation, 4100 West 150th St., Cleveland 35, Ohio

Holan

Subsidiary of THE OHIO BRASS COMPANY

HOLAN



LIGHTWEIGHT▪ SMALL DIAMETER
INSIDE/OUTSIDE STATION WIRE WITH
HIGH-DENSITY POLYETHYLENE INSULATION

Here's what you get with new improved Inside/Outside Station Wire:

- smaller, neater looking wire
- faster installations: wire trains easily due to reduced size, installs with staple gun
- improved electrical and physical properties
- twisted conductors to prevent cross-talk on multiple long runs
- high density polyethylene color-coded insulation with weather resisting vinyl jacket for easy stripping
- lower cost

Another example of how Alphaduct makes available to you the best in new product developments. Insist on Alphaduct Inside/Outside station wires, the newest and finest . . . available either twisted or paired.

National Distributors: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 W. Randolph Street, Chicago, Illinois.

ALPHADUCT
WIRE AND CABLE CO.

Regional Distributors: Buckeye Telephone & Supply Co., Columbus Ohio; The Lindsay Telephone Supply Co., Cleveland, Ohio; Pankey Supply Co., Charlottesville Va.

and Mertens were assistant division managers at Muskegon and Spokane, respectively. Les Barton has served the company for over nine years while Ted Mertens has been associated with the organization for more than seven years.

New Mobile Telephone Equipment With Duplex Dial System

NEW TYPE of automobile-telephone is being introduced by General Electric Co. for use in vehicles receiving mobile telephone service through telephone companies or answering services.

Previously, when a person in a car was transmitting a message to a home or office telephone and the recipient attempted to interrupt, the voice of the wire-line party at home couldn't be heard in the car because the vehicle's push-to-talk button wasn't in the proper position. This occurred because the receiver in the car was disconnected automatically whenever the driver talked.

General Electric's new telephone device is engineered so the vehicle's receiver is no longer inoperative when the car transmits. The new design permits the receiver to remain on and ready to receive a message, picking up the conversation immediately when the home party begins to talk.

General Electric calls the new feature "full simultaneous duplex," signifying simultaneous two-way conversation. It will be especially beneficial in instances where people involved in the conversation with the mobile unit are not aware that the telephone is in a car and that special procedures have been required to avoid message confusion.

Where Direct Distance Dialing service is available through telephone companies, a car equipped with the new two-way dial mobile telephone will be able to place and receive calls to and from any part of the country without the services of an operator to route the call. The two-way dialing system combined with Direct Dialing makes the connection automatically. Where Direct Distance Dialing is not

yet available an operator is used.

The new General Electric two-way dial equipment is designed with a mobile identification encoder which tells the central office automatically where the call is originating so toll charges can be credited properly. This expedites the call so that an operator does not have to perform the task of toll-ticketing.

The equipment is designed for operation in cars receiving telephone company Mobile Telephone Service and in vehicles served by Miscellaneous Common Carrier answering services where interconnection with Common Carrier telephones exists. It employs radio frequencies already assigned by the Federal Communications Commission.

The new unit provides multiple channel access and makes increased channel capacity available. It offers five-channel operation with pushbutton selection as a solution to the "line is busy" problem sometimes encountered by cars attempting to place a call. Regardless of the channel used, an "automatic reverting" arrangement switches the system back to the originally-assigned call channel when a conversation is completed.

Two types of mobile combinations are available in the new design. In areas offering manual mobile telephone service, where placing even local calls through the operator is necessary, General Electric supplies non-dial equipment. This may be field-converted when the telephone company elects to use mobile dial service. For those areas where the telephone company has appropriate automatic central office equipment and does not wish to use an operator for mobile telephone calls, the dial design is employed.

General Electric's Communication Products Department, Lynchburg, Va., supplies the complete package to telephone companies on a lease or purchase basis. This includes the tone signalling and decoding equipment located with the basic radio in a single case in the trunk. Additionally, G-E supplies the single power/control cable, antenna and the integrated control unit for dash or transmission-

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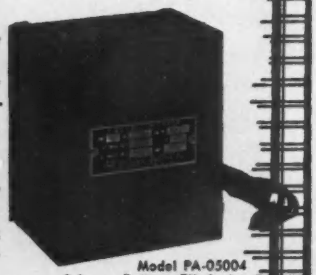
Make SCHAUER your source for dependable DC POWER!

SCHAUER is recognized by the Telephone Industry throughout the world as a leading manufacturer of battery eliminators and battery chargers for almost every DC power requirement. You save with Schauer—on low first cost, low operating cost, and reliable service. See your Jobber or write for Bulletin No. 1470.



Model PA-05004
Schauer Battery Eliminator

Here's a sure SCHAUER power source for the operator's circuit on magneto switchboards

Schauer Type PA-05004 Battery Eliminator delivers constant, hum-free direct current to the operator's circuit. Equipped with relay for automatically transferring power to stand-by dry cells in the event of AC failure. Standard capacity is 4 volts DC at 0.5 amps. Steel case, for wall mounting is 5½"x6¼"x4".

Rectifier Division
SCHAUER
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4516 Alpine Ave., Cincinnati 42, O.

tunnel mounting.

The new design uses the engineering concepts of General Electric's Progress Line of mobile communication equipment and employs Progress Line components. However, the transmitter, receiver and power supply have been designed specifically for the telephone market.

For further information, write *Section P. General Electric Communication Products, Department, P. O. Box 4197, Dept. TE&M, Lynchburg, Va.*

ITT Gets FCC Grant For Space Research

THIS country's first license allocating radio frequencies to private industry to operate an experimental research facility for earth-space communication investigation was issued to ITT Federal Laboratories, Nutley, N. J., last month when the Federal Communications Commission authorized the research and manufacturing division of International Telephone & Telegraph Corp. to make use of its recently completed space research communication station to bounce signals off the moon and passive satellites, and for basic research and study of space communication theory.

The authorization, which is for one year subject to renewal, specifies operation on 2120 or 2299.5 megacycles until July 1, after which only 2299.5 mc may be used. The call letters are KFQXBR.

Located eight miles from mid-town Manhattan, this new research facility consists of a 40-foot parabolic "dish" antenna and a building housing a powerful 10 kilowatt transmitter, and sensitive receiver equipment.

Under direction of the communication systems laboratory headed by William Sichak, the Nutley Laboratories will concentrate on studying the characteristics of radio signals which have traveled several hundred thousand miles through the earth's atmosphere and voids of space beyond.

Scientific experiments are expected to yield data which will be of great value to organizations interested in satellite communication systems capable of handling television as well as telephone traffic.

High on the list of programs for the ITT space facility is a project to evaluate the moon's surface as a reflector for continuous wave radio signals. According to Sichak, the moon's irregular surface, though not an ideal reflector, will be a useful and economical tool for testing future satellite radio equipment and techniques. Although the rough surface of the earth's natural satellite is unsuitable for "bouncing" television or wideband signals, it is convenient for testing transmission equipment.

Engineers responsible for operation of the station indicated that ITT also will be monitoring radio sounds from space, giving particular attention to signals from artificial satellites, stars and planets. This monitoring work is expected to increase in importance as progress continues in space exploration and human beings are sent into space.

Included as part of the receiver circuit is ITT's newly developed parametric amplifier, which virtually eliminates self-generated noise interference and enables the reception of signals which were previously undetectable.

The antenna "saucer" is designed to pivot freely on its pedestal so that it can sweep from horizon to horizon under automatic orbit program control when tracing man-made satellites and celestial bodies approaching from any direction.

In connection with frequency selection matters, the FCC said in an advising letter to ITT, "the Commission wishes to stress that no determinations have been made either nationally or internationally as to what portion or portions of radio-spectrum ultimately may become available for use by operational space communication systems." The ITT facility is a research and development tool.

Anaconda Wire & Cable Sets Up Magnet Wire Division

FRANK B. DICKEY, has been named to the newly-created position of manager — Magnet Wire Division of Anaconda Wire and Cable Co. He will have full responsibility for marketing Anaconda magnet wire products, directing magnet wire field sales-

men, and for establishing magnet wire sales policies and prices. He will report to J. L. Tindale, vice president — marketing and sales. Dickey will continue to have his offices in New York City.

The company also established a Magnet Wire Policy Committee with Dickey as chairman. Other members of the committee include Roy M. Hukle, mill manager, Muskegon, Michigan; A. W. Koch, manager of magnet wire sales, Muskegon; and Emil H. Olson, director of the magnet wire research laboratory, Muskegon.

Commercial magnet wire is manufactured at three Anaconda Wire and Cable plants — Muskegon, Sycamore, Ill., and Orange, Calif.

William C. Kratz has been appointed manager — Automotive Division, with Robert M. Brown assisting him as technical representative.

Robert L. Arnson has been appointed cost supervisor of the Magnet Wire Division.

Lynch Announces New 6 kmc Microwave System

LYNCH Communication Systems Inc., San Francisco, Calif., has announced entry into the microwave communication field with an advanced, flexible "building block" 6 kmc microwave system which provides duplex multi-channel service for complete point-to-point communication for all voice, control and data transmission application. Distribution will be through the company's nationwide U. S. distributor, Graybar Electric Co., Inc.

Donald E. Campbell, Lynch president, said the Lynch Microwave System provides a low-cost flexible transmission medium for telephone, telegraph, teleprinter, facsimile, protective and relaying telemetering, supervisory control, monitoring, data and other communication signals. Lynch Microwave Systems are available for operation in the Common Carrier Band from 5925 to 6425 megacycles; the Industrial Band (Operational Fixed) from 6575 to 6875 megacycles; and the Government Band between 7125 and 7650 megacycles.

Microwave radio transmission provides a medium for carrying a large

"Off The Board"

Communications Securities

Markets as of February 2, 1961	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel. Co.	$3.30			113⅞
Anglo-Canadian Tel. Co. (Br. Col.-Dom. Rep.)	1.20	50	53	
Bell Tel. Co. of Canada	2.20			49⅜
British Columbia Tel. Co.	2.20	48¼	50¼	
Calif. Interstate Tel. Co. (Calif., Nev.)	.70	15¼	16½	
Calif. Pac. Util. Co. (Calif., Nev., Ore.)	.90	23½	25	
California Water & Tel. Co.	1.36	33⅝	35⅛	
Carolina Tel. & Tel. Co.	1.60	42	—	
Central Electric & Gas Co.	1.20	31¼	32¾	
Central Tel. Co. (Minn., Ia., N. C.)	.88	25½	26¾	
Chenango & Unadilla Tel. (N. Y.)	1.20	42	45	
Cincinnati & Suburban Tel. Co.	4.50	104	108	
Citizens Util. Co. (Calif., Pa.) "A"	stk only	20¼	21½	
Citizens Util. Co. (Calif., Pa.) "B"	.56	19½	21	
Commonwealth Tel. Co. (Pa.)	1.00	21¾	23¾	
Florida Telephone Corp.	1.00	29	30¾	
General Tel. & Electronics Corp.	.76			29⅝
Hawaiian Telephone Company	1.00	28½	30	
Independent Telephone Co.	none	8¼	9¼	
Indiana Telephone Co.	.50	25	—	
Inter-County Tel. & Tel. Co. (Fla.)	.72+stk	28½	31	
Inter-Mountain Tel. Co. (Va. Tenn.)	.80	17½	19	
International Tel. & Tel. Corp.	1.00			48
Jamestown Tel. Corp. (N. Y.)	6.00	88	—	
LaCrosse Telephone Corp.	.80	15½	17½	
Lincoln Tel. & Tel. Co. (Nebr.)	2.60	64	—	
Lorain Tel. Co. (Ohio)	1.40	32	—	
Middle States Tel. Co. (Ill.)	.80	28	30	
Mountain States Tel. & Tel. (Ariz., Colo., Mont., Tex.)	.90			28
New England Tel. & Tel. Co.	1.72			44⅛
North Carolna Tel. Co.	none	15/16	1⅛	
Northern Ohio Tel. Co.	2.00	61	64	
Pacific Tel. & Tel. Co.	1.14			37⅛
Peoples Tel. Corp. (Pa.)	4.00	100	—	
Pioneer Tel. Co. (Minn.)	1.00+stk	34	39	
Rochester Tel. Corp. (N. Y.)	1.00			25⅜
Southeastern Tel. Co. (Fla.)	1.00	24	26½	
Southern Nevada Tel. Co.	1.20	34½	37½	
Southern New England Tel. Co.	2.20	48½	50½	
Southwestern States Tel. Co. (La., Ark., Okla., Tex.)	1.28	28	29½	
Telephone Service Co. of Ohio "A"	.36	30½	—	
Telephone Service Co. of Ohio "B"	.36	32	35	
Tidewater Tel. Co. (Va.)	1.40	26	—	
United Utilities, Inc.	1.60	49	51	
Virginia Tel. & Tel. Co.	1.00	20½	—	
West Coast Tel. Co. (Wash., Ore., Calif.)	1.28	30	32	
Western Union Telegraph	1.40			43⅞
Western Utilities Corp.	.36	9⅞	10⅞	
Western Light & Tel. Co., Inc. (Mo., Kans., Ia.)	2.40	51½	53½	

(Source of Market — DEAN WITTER & CO.)

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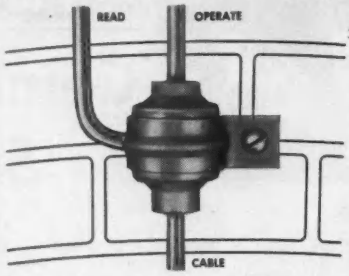
MINIATURE MOTOR VALVE FOR UNDERGROUND, PRESSURIZED CABLES!



Air opens buried valve . . . allows quick check of air pressurization or recharging of underground cable from the surface.

Developed in collaboration with Bell Telephone Laboratories, Inc., this compact, spring-loaded diaphragm valve is attached directly to buried cable at desired check point. OPERATE and READ tubings are led to convenient surface location where air checks and recharging can be accomplished with minimum effort.

When recharging cable, a pressure approximately 20 psig greater than that being added to cable through READ tube is applied through OPERATE tube to keep valve open. Entire valve is made of corrosion-resistant alloys, tin plated, for long, dependable service.

REQUEST Catalog T-1 for complete data on this valve and other Dahl pressure system valves for indicating and regulating air usage in continuous flow systems. G. W. Dahl Co., Inc., 80, Tupelo St., Bristol, R. I.

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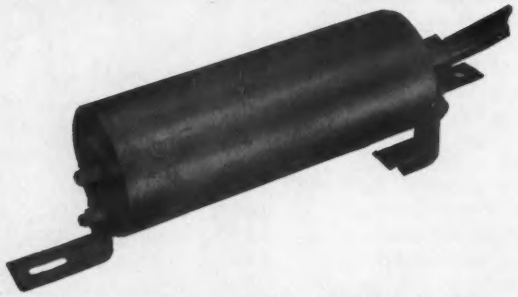
FOR AERIAL (POLE MOUNTING).
CONTAINING FOUR TO FOUR HUNDRED SIXTY COILS.



- LEAD STUB ASSEMBLIES ARE PRESSURIZED, AND
- PLASTIC STUB ASSEMBLIES ARE SEALED IN THERMOPLASTIC COMPOUND TO INSURE PROTECTION FROM MOISTURE.

These assemblies can be equipped with loading coils, capacitors, inductors and MF units.

Write us for assistance on your loading problems.

CEECO Loading Coils are sold by your telephone equipment supplier.

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number of simultaneous telephone or data circuits known as channels.

The Lynch Microwave System, when used in conjunction with the company's newly perfected multiplexing equipment will establish from one to 600 such circuits, and makes possible the addition of communication routing options and extra channels without changing existing equipment. The RF (radio frequency) terminal equipment is the basic "building block" for all stations. Multiple combinations of this basic assembly are used to form Repeater and Junction stations. Lynch Multiplexing equipment is designed to provide from one to 600 channels with no penalty to the small user who must start with 12 channels or less. Therefore a Lynch Microwave System can be installed initially with only a few carrier channels and, as traffic increases, it can be expanded economically by adding more channeling equipment. As many as four paralleled microwave channels can use the original antenna system for system expansion or for standby or frequency diversity operation.

Basic channeling equipment for the Lynch Microwave System is another new Lynch product — the recently introduced fully transistorized B910 Multiplexing System which makes possible the simultaneous transmission of a large number of voice carrier channels over a single circuit. This system will economically provide from one to 12 channels, and can be expanded to an ultimate of 600 channels of voice communication or certain types of data transmission over a single microwave circuit. Campbell said the first installation of the B910 Multiplexing System will be in operation for a California telephone company early in 1961, providing in-service telephone circuits over microwave systems.

Other Lynch channeling equipments available for microwave application include: FM multiplexing, subscriber single sideband suppressed carrier telephone systems and one-way data transmission channels.

Campbell said the addition of microwave equipment to the expanding line of Lynch communication prod-

ucts and systems fits into the company's long range plan and is motivated by the increasing use of microwave by telephone companies and other communication users.

L. M. Berry & Co. Holds Management Conference

"MEET THE GOALS of '61, The Record Shows It *Can Be Done,*" L. M. Berry & Company's theme for 1961, was the central idea at the firm's annual Management Conference held in Dayton, Ohio, recently.

Giving the opening address before the 54 executives, which included executives from the company's general office, members of the general office sales staff, and territory and division management personnel, General Sales Manager J. William Craig, Jr. outlined the overall results that were attained in 1960 and previewed the company's broad plans and objectives for 1961. He then unveiled the 1961 theme, and pointed out that the confident spirit which it proclaims has been the credo of Founder Loren M. Berry for the past 50 years. He emphasized that by entering the new year with this confident idea as a guiding force, the goals of increased revenue and better service will become a reality.

General Sales Training Managers W. C. Fish and J. W. Nagel then discussed sales training, stressing the importance of continuous training, evaluation, and retraining as a requisite in maintaining a capable sales force. Craig and General Sales Assistant R. F. Watts presented the topic, "Sales — Problems and Trends," giving particular attention to problems current in the field of sales today, the over-riding need for truthful and factual advertising, and the use of specialization in various phases of the directory sales job. W. L. Wolcott, personnel and training director, the final speaker of the first day, discussed a new sales trainee compensation plan.

Sales Promotion Supervisor J. W. Egnor opened the second-day's session speaking on standardization of the sales promotion job, and the importance of the sales promotion supervisor and his department in the

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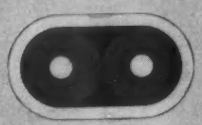
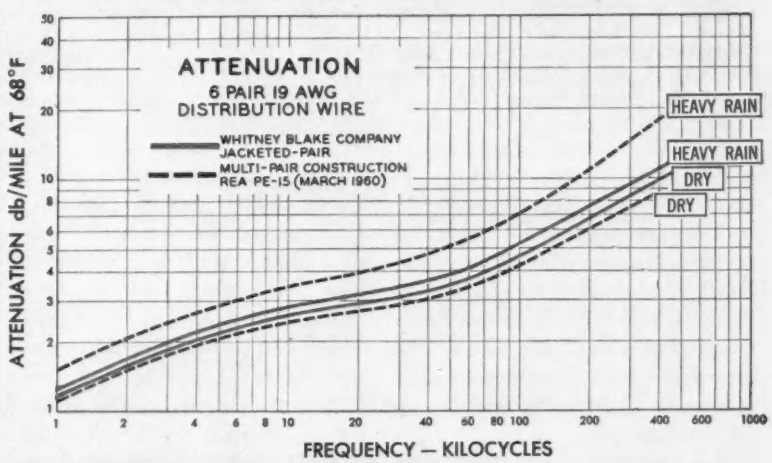


JACKETED-PAIR now makes possible the use of carrier equipment as a result of the relatively small change and low level of attenuation. For example, at 400 kilocycles, the attenuation for PE-15 type increases 106% from dry to heavy rain while JACKETED-PAIR increases only 12% at this frequency.



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Group Picture of L. M. Berry & Co. Management Conferees — *First Row* (l. to r.): R. A. MANER, Florida Division Manager; E. F. TINNERMAN, Wisconsin Territory Manager; F. L. HAWKER, Eastern Territory Manager; J. P. WHITE Southern Territory Manager; JOHN W. BERRY, Managing Director; LOREN M. BERRY; W. A. STEUER, General Manager; J. W. CRAIG, JR., General Sales Manager; H. F. SCOTT, Mid-Western Territory Manager; J. P. FRAIM, Executive Assistant; W. L. WOLCOTT, Personnel Director. *Second Row* (l. to r.): H. C. HULL, Statistician; J. M. BAYLEY, Eastern Sales Manager; W. C. WELCH, Kentucky Division Manager; R. F. WATTS, General Sales Assistant; J. C. RUDWALL; S. H. RAINEY, National Yellow Pages Service Manager; J. E. WHALEN, Wisconsin State Division Manager; PHIL ENGLE, General Art Director; L. P. GERMUSKA, Ohio Division Sales Manager; M. F. FEENEY, Milwaukee Division Manager; H. L. BOEBEL, Mississippi Division Manager; C. A. SMITH, Tennessee Division Manager; W. J. McGIRL, Southern Sales Manager; R. H. ESHELMAN, General Sales Supervisor. *Third Row* (l. to r.): R. W. BRUNDIGE, Sales Promotion Manager; R. T. DAVIS, New York Division Manager; H. C. EVANS, Mid-Western Division Manager; J. B. BOWEN, Alabama Manager; N. E. ROBINSON, Ohio Division Manager; J. C. GRIMES, Tennessee Division Sales Manager; J. D. BRISTOW, Mid-Western Division Supervisor; J. D. BECKHAM, Southern Personnel Manager; C. S. AUCOIN, Assistant to Wisconsin Territory Manager; B. D. ADDINGTON, Mid-Eastern Division Manager; S. E. PHILLIPS, Western Division Manager; W. C. FISH, General Sales Training Manager; R. W. ALEFF, Louisiana Division Manager; H. LAMARCHE, Pennsylvania Division Manager. *Fourth Row* (l to r.): E. J. SMITH, Mississippi Division Sales Manager; J. W. EGNOR, Sales Promotion Supervisor; T. M. KENNEY, Assistant General Art Director; L. E. HURRELBRINK, Kentucky Division Sales Manager; J. J. MULLIN, Procedures and Methods Manager; W. R. CALHOON, Auditor; J. W. SCHMIDT, Procedures and Methods Supervisor; L. J. WYETH, National Sales Coordinator; E. J. WALTON, Staff Assistant; M. A. RANDALL, Milwaukee Division Sales Manager; W. R. GREEN, Mid-Western Territory Sales Administrative Supervisor; E. W. BRAY, Louisiana Division Sales Manager; J. L. BOWLING, Florida Division Sales Manager; J. W. NAGEL, General Sales Training Manager; J. H. DEACON, New York Division Sales Manager; R. E. SHEARER, Alabama Division Sales Manager.

division organization. He was followed by General Sales Supervisor R. H. Eshelman, assisted by Milwaukee Division Manager M. F. Feeney and Nagel, who presented many new sales ideas and trends in the Yellow Pages industry and gave case histories of successful application of existing ideas relating to the planning operation of sales campaigns.

The afternoon was devoted to a discussion of personnel procurement with Wolcott presiding. Assisting him were Southern Territory Sales Manager W. J. McGirl, Tennessee Division Manager C. A. Smith, Mr. Eshelman, Alabama Division Manager J. B. Bowen, and New York Division Manager R. T. Davis. This group discussed employment of new sales personnel, manpower sources, and gave specific procedures and results in certain divisions.

The third day began with a talk by Procedures and Methods Manager J. J. Mullin on office operations in the field. He discussed clerical wage studies, training aids, and new phases of the office operation of the future, such as data processing and automation. He was assisted by D. S. Lewis, of the management consulting firm of Arthur Andersen and Co., Chicago.

S. H. Rainey, National Yellow Pages manager, explained the organization of the NYPS Department, its purpose, progress, and relation to the company operation. John W. Berry, managing director of the firm, followed with a talk on the future of the Berry organization and the importance of the individual in meeting the challenges of 1961. Auditor W. R. Calhoon and J. C. Rudwall assisted Berry in a joint presentation of profit responsibility and budgeting.

General Art Director Phil Engle started the final day with a review of art production in 1960, a presentation of the results obtained through the use of the Art Department's "Special Spec" copy service, and an explanation of art principles in preparing effective ads. Sales Promotion Manager R. W. Brundige presented the company's sales program for 1961, which included the new sales incentive contests, sales supervisors' contests, and other incentive programs that will back the sales effort during the coming year. Brundige was assisted in his presentation by Tennessee Division Manager C. A. Smith, Personnel and Training Director W. L. Wolcott then introduced a new telephone sales retraining course soon to be released to the field organization.

As the final day of the 11th annual

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MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

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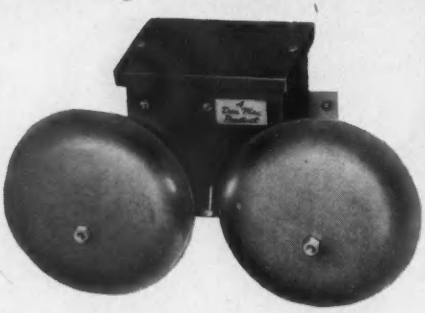

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Lead (All New)
26 Pair #19 Ga. Paper Ins.
Lead Covered, Double Steel Wire Armor, two Layers Jute .....14,000 Ft.
(800 & 500 Ft. Lengths)
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OTHER CABLE

11 Pair # 19 Ga. Paper, Lead .... 22,000 Ft. (4,500 Ft. Reels)
7 Quad. #19 Ga., Paper, Lead ..100,000 Ft.
7 Quad. #19 Ga., Plastic, PVC .. 5,300 Ft.
37 Quad. #19 Ga., Paper, Lead .. 1,050 Ft.
51 Pair #19 Ga., Paper, Lead .... 1,200 Ft.
(plus 4 #16 Shielded Pair with polyeth, insulation) video, radio, carrier, etc.
303 Pair #22 Ga., Ankoseal 775P 1,600 Ft.
404 Pair #26 Ga., Paper, Lead .. 2,800 Ft.
152 Pair #26 Ga., Paper, Lead .. 2,000 Ft.
16, 26, 51 Pair #22 Ga., W.E. BUA, coded, textile Lead switchboard cable.

Quantity Discounts

5 Pair, #19 Neoprene (Latex Ins.) coded. New Army type—
1,000 Ft. Reels $50.00
10 Pair, as above, 100 Ft. Coils $10.00
Spiral 4, 1 Star Quad, #18 Stranded, Neoprene Jacketed ⅜" OD, Self-Supporting (also suitable for direct burial) 1320 Ft. Reels with Quick Connector. (6 MH Loading Coils Built Into Connector. $50. Reel).

Also New Plastic Type For Export Only

DROP WIRE, New #.104 Copperweld 40%, twisted Pair, Heavy Neoprene Jacket.
2000 to 4000 Ft. Reels .....$40. M. Ft.

#18 Ga., Copperweld, Neoprene, Reinforced Parallel, Lengths Average 500 Ft. (Used). Very good condition .....$10. M. Ft.

#14 Ga. Copper (Med. Hard drawn) New — Twisted Pair — PVC Plastic (1 black, 1 white) Factory coils 300' to 1000' (one length) per coil, No Splices ....$20. M. Ft.

DROP or Bridal WIRE — Neoprene Twisted Pair #20 ga. Copperweld 1000 Ft. Coils— New .....$15. M. Ft.

Field Wire W110B, Twisted Pair (3 copper — 4 steel strands per cond.) Rubber covered cotton braid — ½ Mile Steel Reels ..$7.50

Field Wire — WDITT — Nylon Plastic (4 copper — 3 steel strands per cond.)

Twisted Pair — Late type — used, (in Tactical Maneuvers) — May have Several Lengths per mile reel. Not spliced (wt. 70 lbs.) .....per mile $20

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Require person familiar with market, sales promotion, distribution, also a technical background in telephone systems desirable. Sales program to independent telephone companies, railroads and other utilities includes such equipment as voice repeaters, PABX, CDO's, etc.

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Write for information and low prices on all 5 Vermeer Models.

VERMEER MANUFACTURING COMPANY
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(Concluded from page 98)

Management Conference drew to a close, General Sales Manager J. William Craig, Jr. called on each conferee to speak briefly, and presented each with a memento of the occasion. The company-wide conference was followed by similar meetings in each of the 14 divisions which were attended by division managers, their staffs and sales supervisors.

E. J. McGuinness New Lenkurt Office

LENKURT ELECTRIC has opened a new branch office of its Government Relations Department at 225 N. Washington St., Rome, N. Y. The Rome area previously had been covered by Lenkurt's Eastern Area headquarters at Washington, D. C.

Communications Engineer Edward J. McGuinness has been placed in charge at Rome and will be responsible for the Northeastern Area — Griffiss Air Force Base and Hansen Field at Bedford, Mass.

E. J. McGUINNESS

Before joining Lenkurt last year, Mr. McGuinness was a sales engineer for the Stromberg-Carlson Co., Rochester, N. Y. He was employed as a plant maintenance supervisor by the General Telephone Co. of Upstate New York from 1951 until joining Stromberg-Carlson in 1956. From 1946 to 1956, he held a variety of installation and supervisory positions with Western Electric Co. at Syracuse and Utica.

How To Simplify Conduit Bending

AN 8-page Bulletin No. E-301 that gives complete instructions, charts, and data for using the new Greenlee No. 1807 Pipe Bending Degree Indicator is available from the Greenlee Tool Co., Rockford, Ill. The 1807 Bending Degree Indicator, recently introduced to the trade, simplifies and speeds bending operations, and eliminates costly spoilage by automatically measuring the degree of bend as it is being made.

The new booklet features an easy method for laying out and bending pipe and conduit ½" to 6" in diameter. Steps are fully illustrated and described in simple, easy-to-understand examples. Two pages of tables provide all data required for making 10" to 84" radius bends.

Copies of the new bulletin are available upon request to *Greenlee Tool Co., Dept. TE&M, Rockford, Ill.*

STROMBERG-CARLSON

Transmitter

NEWS AND VIEWS OF INDEPENDENT TELEPHONY

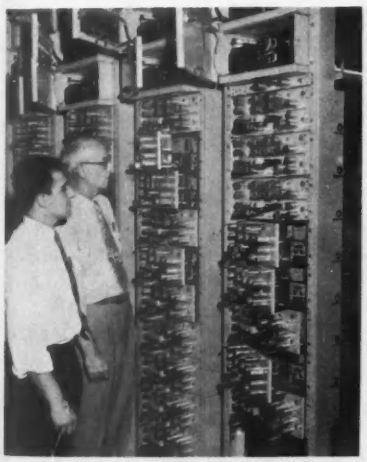
VOLUME 9, NO. 11 • FEBRUARY, 1961

Pioneer Telephone Co-op plans microwave-carrier system to boost revenue at Kingfisher, Okla.

"When the time comes to expand, all they'll need to do is say the word."

A Stromberg-Carlson carrier engineer was discussing the toll revenue producing program adopted by the Pioneer Telephone Cooperative of Kingfisher, Oklahoma. The system, soon to be placed in operation, will use a combination of trunk carrier and multiplex-microwave gear to form a network of toll circuits.

Stromberg-Carlson is serving as prime contractor for the system, supplying thirty channels of 565 Trunk Carrier and forty channels of 511 Multiplex equipment.



Dependable 511 Multiplex supplies the "brains" for the microwave system which will be installed between Kingfisher and Watonga, Oklahoma.

Pioneer Telephone Cooperative, which serves 10,000 North Central Oklahoma subscribers, is composed of 34 exchanges. The headquarters is Kingfisher, and this will serve as one end of the microwave hookup. The town of Watonga, 27 miles west, will be the other end.

Each of the two towns will be connected to a number of Pioneer exchanges in the area by 565 Trunk Carrier. Several of the neighboring exchanges will be provided extended-area service as well as toll service.

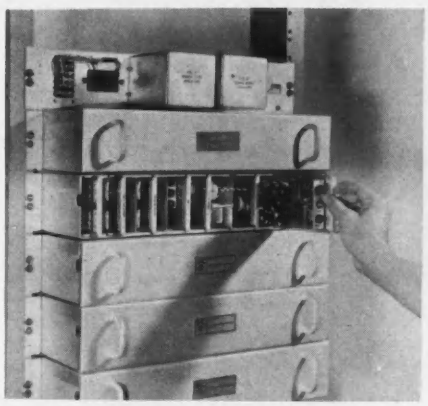
The Kingfisher exchange will be connected to non-Independent toll facilities through 26 trunks to Oklahoma City, 8 to Enid and 3 to El Reno, Okla. There will also be 3 toll circuits running from Watonga to the non-Independent outlet at Hitchcock. Okla.

The Pioneer system will use Stromberg-Carlson's new 8-channel 565 Trunk Carrier. This recently developed 8-channel system is also available in 561 Subscriber Carrier.

Pioneer Telephone Cooperative is completing its 7th year in the telephone business. Although a relatively young company, it has made tremendous strides in bringing modern telephone service to Oklahoma.

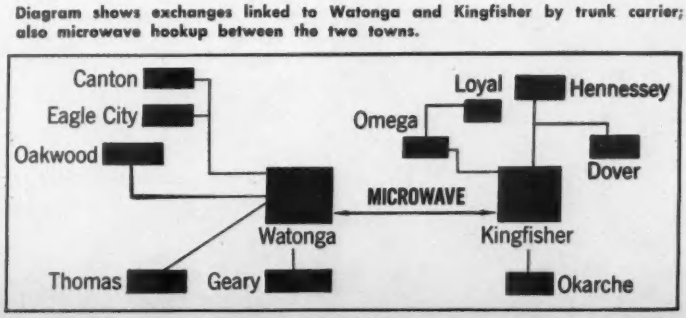
R. C. Boecher has managed the Cooperative since its beginning in May, 1954. At that time Pioneer Tel purchased its original four exchanges. Truman Wood, Pioneer assistant manager, has worked closely with Mr. Boecher in guiding the Co-op to its present position.

Pioneer Telephone Cooperative easily justified its proposed toll network on the basis of population growth in the Kingfisher-Watonga area. Nearby Oklahoma City has gained 25% in population during the past 10 years. Corresponding gains are common in the region.



Pioneer Telephone Cooperative will use the recently developed 8-channel systems of Stromberg-Carlson 565 Trunk Carrier. The carrier will supply extended-area service and toll service to a number of exchanges.

Diagram shows exchanges linked to Watonga and Kingfisher by trunk carrier; also microwave hookup between the two towns.



In the January *Transmitter* we failed to identify the telephone manager in the small masthead cut on the front page — Paul Feldtmose of Tyler, Minn. The old switchboard offers a striking contrast to the XY® Dial equipment in his switchroom.

Advertisement

Frank Flynn, combination man at Worthington (Minnesota) Telephone Company, uses a Stromberg-Carlson Type "D" Test Desk to spot trouble in the local outside plant facilities.

Test equipment speeds up maintenance, cuts trouble-shooting time

XY Dial systems, like fine watches or precision instruments, are built to provide quality service for years to come. The best way to insure this peak performance is through a thoughtful preventive maintenance program. Hundreds of telephone companies are carrying out just such a program with Stromberg-Carlson test equipment.

This test gear is designed to speed your trouble shooting and pare your maintenance time to a minimum. Each set thoroughly tests a definite area of your telephone operation. Using this equipment regularly provides a fast, accurate means of testing both your in-plant and outside-plant facilities.

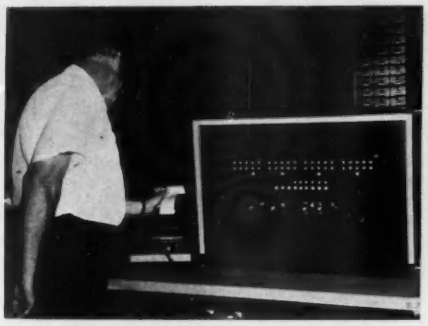
The Type "C" Test Turret — This test fixture, designed especially for the small central office, is equipped to test both inside and outside facilities. The circuits are neatly arranged in a No. 121 Cordless Switchboard cabinet to promote efficient operation of the turret.

The Type "D" Test Desk — This is a must for the larger central office that requires more local testing facilities than the Type "C" can offer.

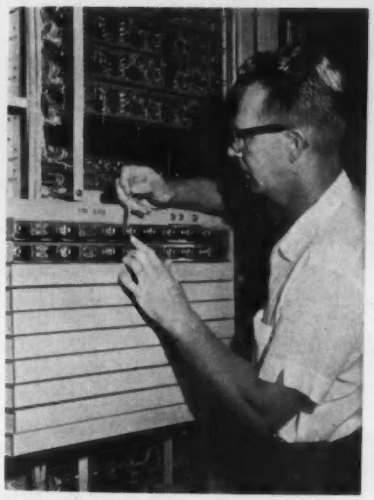
Irving Springer, manager of Madelia (Minnesota) Telephone Company, uses a "Buttinsky" to place test call over his XY Dial Equipment.

Toll testman Garry Young checks out a new circuit recently added to the large and growing office of the Michigan Bell Telephone Company at Hastings.

A Stromberg-Carlson Type "C" Test Turret is being put to good use testing out local lines at the Boscobel (Wisconsin) Telephone Company by Al Johnson, equipment maintenance supervisor.



Line routiner automatically checks position on each line, points directory number and fault code should trouble be encountered. At Hastings office of the Michigan Bell Telephone Company, this test fixture, being read by Edward A. Freeland, local test man, is known as the "Wet Weather Insulation Test Box."



"Glad to endorse," says Paul Feldtmose, manager of Tyler (Minnesota) Telephone Company, about Stromberg-Carlson equipment. He is shown here checking a relay in his Fire Alarm circuit at the exchange.

All equipment is mounted in a No. 204 PBX Switchboard cabinet and can be multipled to other testing positions if desired.

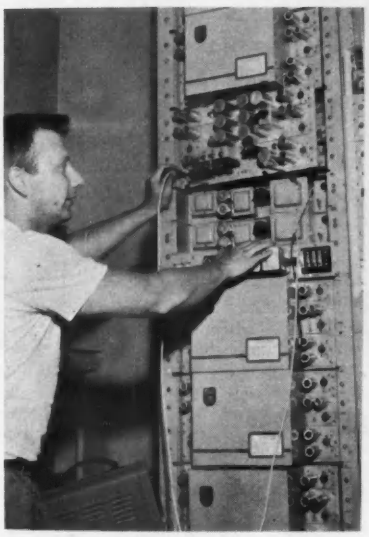
The Type "E" Test Panel — The largest and most complete of three test fixtures has all the features contained in the Type "C" and "D." It is equipped for testing toll as well as local facilities.

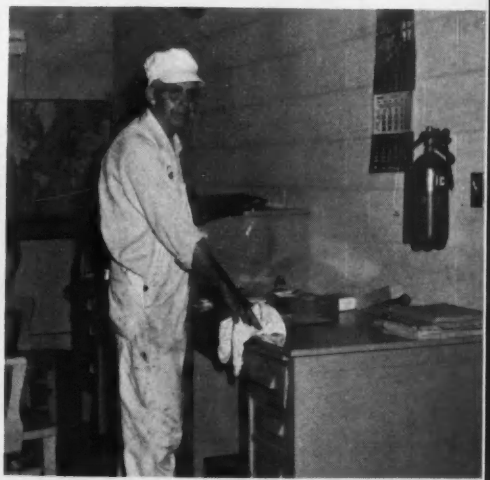
Automatic Line Routiner — This is the newest type of testing equipment developed by Stromberg-Carlson. Its primary function is to automatically test inside and outside plant facilities. The routiner, once started, needs no further attention. It provides a permanent printed record of all faults found in testing out an office.

Also shown at the bottom of these pages are a few of the portable-type test fixtures that are available from Stromberg-Carlson. They are from the left: Current Flow Test Set No. 6C, XY Universal Switch Test Set No. 10B, Circuit Plate Test Set No. 11, and the Negative Impedance Repeater Test Set No. 541-A41.

Remember, a dial telephone exchange is an investment for the future. Treat it wisely and it will repay you a hundred-fold. If you are interested in protecting your investment, then contact your nearest Stromberg-Carlson representative or write direct to Stromberg-Carlson for a complete listing of available test equipment.

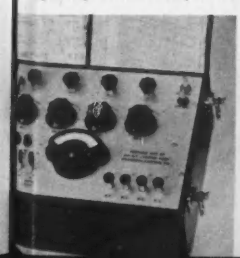
Jerry Suomalainen, equipment supervisor, performs his monthly check of Carrier apparatus with the aid of an oscilloscope at Mille Lacs Telephone Company in Onamia, Minnesota.

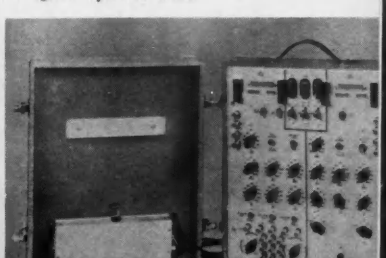




Another form of maintenance is "general housecleaning," being demonstrated here by Reibert Latham, building maintenance man of Boscobel (Wisconsin) Telephone Company. By keeping dust and dirt to a minimum, the costs of trouble shooting and equipment maintenance are reduced proportionately.

Shown below are the portable test sets: Type 6C, 10B, 11 and 541-A41. These sets completely check relays, XY Universal Switches, circuit plates and negative impedance repeaters, respectively. They have the advantage of being portable, they can be carried to a bay frame, shelf or to a handy table or bench to test or check particular apparatus. Valuable to small and large companies alike.





Your Independent neighb

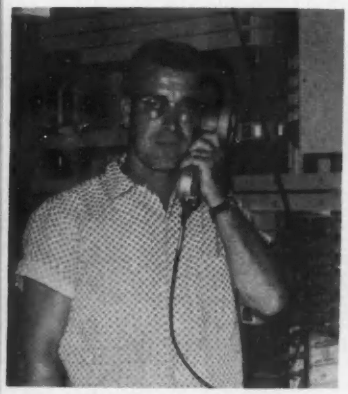
Informal flashes

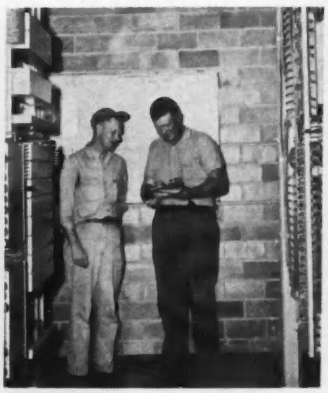
Looks like a busy year for August Steinhart, who will convert 12 exchanges of the North-West Tel. Co. (Wisconsin) to XY Dial in '61.

Just a single phrase or idea distilled from many that bring back memories of your editor's 1960 vacation calls in the Midwest.

Newton, Iowa: (Mrs. Travis) "My sister discovered a shy little girl in Chicago's North End — Kim Novak." *New London, Minn.*; Mrs. Lundgren, an operator before dial conversion, "lived in" to give night service. *Nor Springs, Iowa*: "More people know your salesman, Vic Burchett, than this town he used to manage." *Grantsburg, Wisc.*: Inaction during period of Bell ownership led to repossession by Independent group and a complete modernization. *Wyoming, Iowa*: Conversion made Jones County

Small industry balances a predominantly agricultural economy at Grantsburg, Wisconsin. McNally Machine Co. is largest employer; others include a folding house-trailer plant (left) with exciting new product. Claire Erickson, shown with his family (right), has assumed manager-ship here; system now serves three towns, 1050 subscribers.





Harold Spletter (left) is president and manager of the New London, Minn., properties once operated by Mr. J. M. Bolstad (right). Size of company doubled when switchers asked to be taken in at conversion to XY Dial. Mrs. Leona Lundgren is secretary-treasurer.

Teamwork between small companies strengthens both — Clifford Axon (with Mrs. Axon in right photo) and son Kenneth Axon operate Goldfield, Iowa; Calvin Anderson, manager at nearby Woodstock, helps with maintenance and installations.

With five good-sized exchanges now converted to dial, Lambert Greene (left), manager at Chisago City, Minn., and Wayne Breeden, combinationman, are promoting extensions, business telephones, extra "teen-age" lines.

Engineering responsibility with United Telephone Company of Iowa at Newton. Standing: Gene Savage, division equipment superintendent; seated: H. D. Brown, equipment maintenance supervisor; Glenn Robertson, state area carrier maintenance.

the camera—

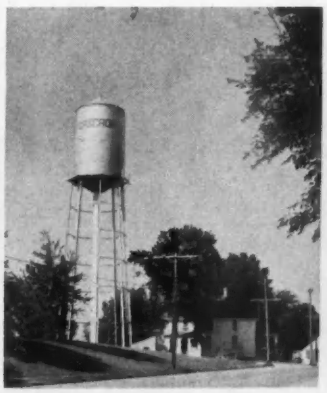
at F-16: No. 2

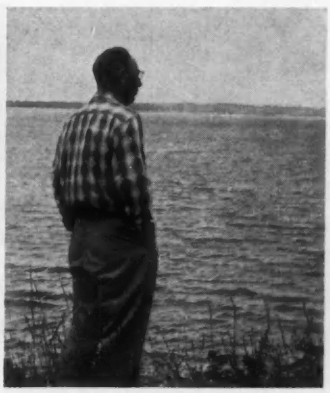
the first in Iowa to be 100% dial. *Spicer, Minn.*; When Sig Simpson took over in 1937, office was closed for lack of business. *Cascade, Iowa*: One man, a bookkeeper and XY® Dial provide top-grade service. *Chisago City, Minn.*: Known as "Little Sweden," area is suburban to St. Paul, but preserves colorful holiday traditions.

Operational efficiency through centralized accounting procedures. New London, Iowa, headquarters of the Iowa-Illinois Telephone Co., furnishes area-wide billing through this office. Latest machines fit naturally in operation this size.

At Wyoming, Iowa, is the smallest National Monument in the country — just the size of the stone marking grave of first doctor in territory. Telephone company Board (right), headed by Mr. Lumir Ingersen, has brought in XY Dial service. Manager "Bill" Urling showed ingenuity in building a small PBX system for motel out of magneto components, doorbells and imagination; agrees that if you count labor a 6K-1 would have been cheaper.

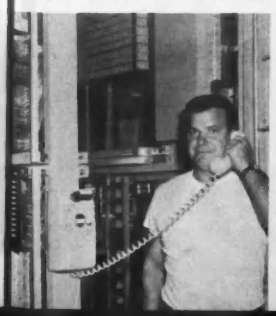
Jerry Green manages a neat little operation at Cascade, Iowa, where service is now excellent. Local businessmen took over company when former owner refused to go dial. Jerry usually erects poles by hand, alone, but expects to hire a helper for road moving job.





Sigward Simpson, pres., Green Lake Telephone Co., Spicer, Minn., stands on shore of his chief asset. Lake has drawn thousands in summer, now enjoying "Florida-type" land boom of permanent residents. Norwegian Chapel is center of Lutheran Bible Camp.

Four northern Iowa towns are served by the Farmers Mutual Telephone Co. of Nora Springs, L. P. Lorentzen, genl. mgr. Ron Laudner (left) is plant supt.; Mrs. Robert Dancliff, cashier. One unusual feature is a buffalo ranch on edge of town, shipping fresh meat East for special dinners.



Part of the Engineering Group at New London headquarters of Iowa-Illinois Telephone Co. More than 100 exchanges are now operated by this company, already one of the largest Independent groups.

Rolla Johnson, center, Gulf States Telephone general manager, has played a key role in keeping his company's telephone service the most modern available. Here he looks over the XY Dial equipment at Kaufman with William Hill, local manager, right, and Carl Price of Stromberg-Carlson.

Gulf States' latest showplace: Kaufman, Texas

Smiles of satisfaction were abundant at the cutover ceremony. These four belong to men who were instrumental in bringing dial to Kaufman. From the left: William Wallace, wire chief; Bill Riley, Stromberg-Carlson; L. A. Wallace, equipment engineer; B. C. Trambell, manager of Gulf States exchange at Athens, Texas.

This is the functional and stylish new telephone building at Kaufman, Texas.

For Rolla Johnson, general manager of the Gulf States Telephone Company, the recent conversion of Kaufman, Texas, to XY® Dial marks another big step toward the goal of 100% modern dial operation. About 90% of the more than 25,000 subscribers now have this service. Most of these conversions have been made under the managership of Mr. Johnson, who joined the company in 1945 after ten years with an Independent supplier and World War II service in the Communications Section of the Eighth Army.

The Gulf States Company celebrates its 50th year of incorporation in 1961, but the original telephone company, founded by Judge S. A. Lindsey and bearing his name, is one of the oldest in the entire Southwest. Mr. John F. Merrick is president.

Kaufman lies on the direct route from Tyler, which is company headquarters, to Dallas, and growth in the area is now strongly affected by the outward push from the metropolis. Thus it became very important for Mr. Johnson and Lew Wallace, equipment engineer, to specify a dial system that would meet the projected growth efficiently.

The city has also become a toll center, homing on Dallas and serving several small neighboring exchanges. A new building was designed for the switching equipment; the former exchange is being remodeled as a business office.

Progress of the Kaufman exchange is readily illustrated by the number of stations served. At the time of purchase, there were 368 telephones in Kaufman. In 1948, that number had increased to 722. Since then, the total has nearly doubled to 1323, and it is expected to continue rising as new service requests follow the XY Dial installation.

Among the most interested observers at the cutover cermony were Miss Annie Williamson, who joined the company in 1915, and Mrs. Mattie Jackson, whose service record is 28 years. She started with the company just two years after the Kaufman property was purchased by Gulf States. Both ladies agree that the last 15 years have been the most noteworthy in company progress and subscriber satisfaction.

Operators keep busy, because Kaufman serves as a toll center for several small exchanges in the area.

Mrs. William Hill is happy about dial installation at exchange managed by husband. Sharing Mrs. Hill's enthusiasm are Rolla Johnson, center, and Charles Fogg of Stromberg-Carlson.

Transmitter
GEORGE B. FORBES, Editor
J. T. LONG, Associate

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

TE&M's Continuing Study Of The Telephone Industry

OUR Research Department, with the "Forecast Issue" of TELEPHONE ENGINEER & MANAGEMENT completed, is starting another study of the telephone industry. And we have been asked to help things along by requesting each one of the companies, Independent and Bell, served by TE&M to send us a list showing:

(1) In alphabetical order the location of each exchange operated by the company; (2) Type of exchange — dial, common battery or magneto; and (3) Number of telephones in service at each exchange.

To aid our Research Department, we will appreciate receiving the information on a form similar to the one shown on this page.

Hope you'll help our study along by giving us a helping hand. Please mail your report to *Research Department, Telephone Engineer Publishing Corp., 7720 N. Sheridan Rd., Chicago 26, Ill.*

"Telephone Engineer & Management's" Survey of Exchanges and Telephones Operated by U.S. Telephone Companies as of 1/1/61.

Name of Company: Point Cross Telephone Co., Inc.

Street Address: 264 Main St.

City: Alexis Zone 4 State Ind.

Report Prepared By: John Doe Title Gen. Mgr.

EXCHANGES OPERATED BY THE COMPANY

EXCHANGE LOCATION — Give City and State (List in Alphabetical Order)	TYPE OF EQUIPMENT — Check One For Each Exchange			TELEPHONES IN SERVICE — January 1, 1961 (Show Total In Service at Each Exchange)
	DIAL	COMMON BATTERY	MAGNETO	
(1) Alexis, Ind.	√			1,500
(2) Bannister, Ind.			√	864
(3) Cleerlake, Ind.	√	√		412
(4) Sunnyside, Ind.	√			1,400
(5) Trampton, Ind.	√			812
(6) Union, Ind.	√			614
(7) Waverly, Ind.	√			500
(8) Weston, Ind.	√			712
Totals	7	1	1	6,814

"Shotgun or Rifle?"

HARLEY J. BARBER, secretary-treasurer of the Oregon Independent Telephone Association looked at the picture on page 44 of the January 1 TE&M, and promptly wrote us as follows:

"I'll bet a lot of sportsmen got a kick out of the title to the picture on page 44 of your January 1st issue, wherein John Schwaller of Ramset is presenting a Winchester model 12 RIFLE to Myron Mahr of Intrastate Tel. Co. . . . If that isn't a shotgun, I'll eat it lock, stock, and barrel. In fact a beautiful gun like that makes me drool anyhow . . ."

We've passed Mr. Barber's letter along to the folks at Olin Mathieson, and will let you know what they tell us . . . In the meantime, why don't you take another look at the picture and tell us what you think it is?

"A Big Order"

AT TE&M, reader mail is of top interest to all staff members, and helping readers who ask for help is a big and important part of our editorial job.

But last month a letter from Jaime Soto Hernandez, of Cucuta-Colombia, had us *"lost for a proper answer."*

Briefly Mr. Hernandez wanted to obtain a *"handbook covering the whole phases of exploitation of a telephone company, such as: accounting, control systems, organizations by department as well as personnel, rules of governing, and all concerned with the industry."*

How about you? Do you know of a book, or several books, that will help Mr. Hernandez? We'll appreciate hearing from you.

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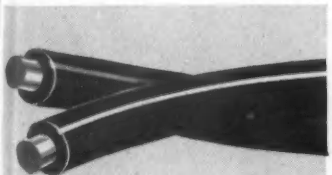

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Arvel Phillips

Arvel is one of our "revenue men" in Herrin, Illinois.

He attended Southern Illinois University in Carbondale, and later served as principal of the elementary school in Benton, Illinois.

After a hitch in the Coast Guard from 1942 to 1945, Arvel returned home and began his career in sales.

It was in 1952 that he joined the General Telephone Directory Company as a sales representative in our Herrin Unit. In 1954, he was promoted to supervisor.

He, his wife and his 13-year-old son make their home right in Herrin. When Arvel is not working, he spends most of his time outdoors. His hobbies are baseball, golf, boating, hunting and fishing. He puts his sports knowledge to good use in his work with the Boy Scouts, home town boys' baseball teams and Church youth groups.

Arvel Phillips is a good example of the "revenue men" who work for General Telephone Directory Company and for you. Men who are an asset to any community in which they live.

You get more than extra sales when you put one of our "Revenue Men" to work on your directory.

His manners, his methods will be a positive credit to your company. He'll be welcomed by your advertisers.

He'll work together with you to produce a book you can be proud of. A directory with complete Yellow Pages service–showing the public where to go for all kinds of purchases, rentals and services. A directory with maximum accuracy, maximum revenue.

And you won't have a worry in the world. Selling, publishing and printing are all done to perfection as part of our Complete Directory Service Plan.

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